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FOR THE HOME AND HOME OFFICE

SEPTEMBER 1987

VOLUME 5
NUMBER 9

PC-COMPATIBLE REVIEW
THE AMSTRAD PC1512

FAMILY COMPUTING

**The
Tandy Man**
Computer Giant
Gives You Two
New 1000's

**Corporate Dropouts
Go Into Business at Home**

**Learning With Computers:
What Parents
Should Know**

**Meet Our Computing
Families of the Year**

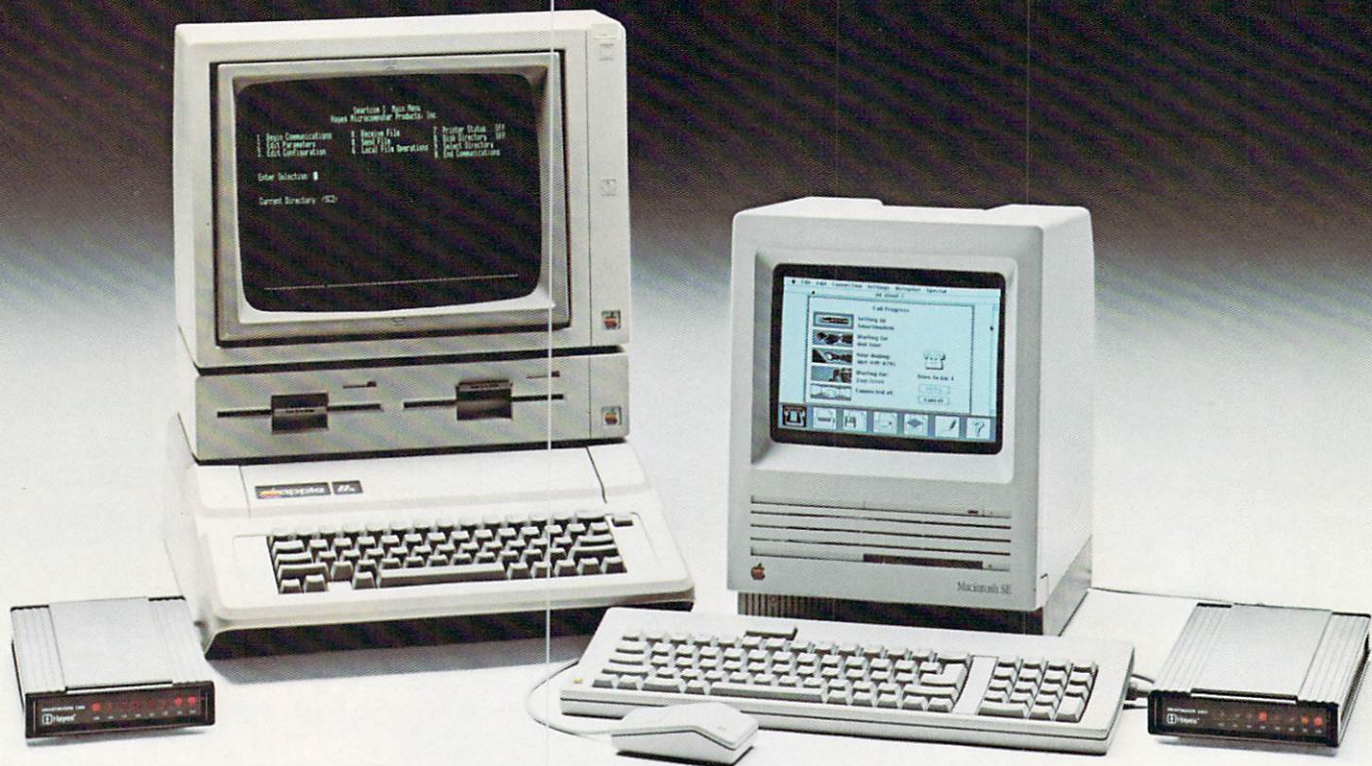
**Add a Mouse or
Trackball To Your
Computer**

Tandy Chairman
John V. Roach with
the 1000 HX and 1000 TX
(Previews Inside)



24 AT-A-GLANCE
SOFTWARE REVIEWS

ORIGINAL PROGRAMS FOR ADAM, APPLE II
SERIES & MACINTOSH, ATARI 800 / XL / XE
SERIES, COMMODORE 64 / 128, IBM PC &
COMPATIBLES, TANDY COCO, TI-99/4A



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Smartmodem 1200A™

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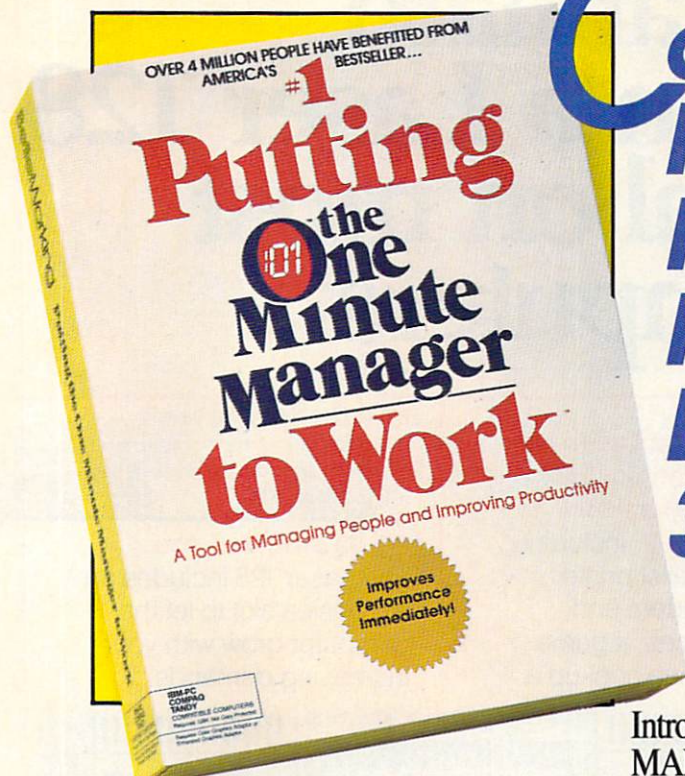
Our Smartmodem 2400 and Smartmodem 1200 are also compatible with all versions of the Apple Macintosh™, including the Macintosh Plus, Macintosh SE and Macintosh II.



There's even a specially bundled package for the Macintosh that contains a Smartmodem 1200, modem cables and Smartcom II® software. Smartcom II is our award-winning software specially designed to take advantage of the power and graphics capabilities of the Macintosh.

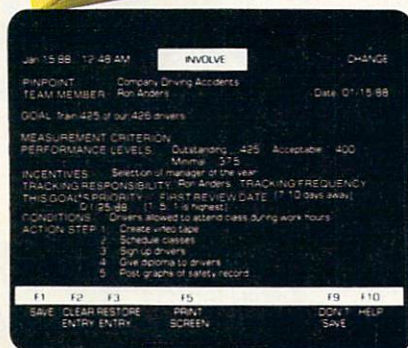
Last but not least, there's another feature that Hayes 2400 and 1200 bps modems offer that will make them even more compatible with Apple computers, and that's a new low price.

Hayes.



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Introducing PUTTING THE ONE MINUTE MANAGER TO WORK. An important new software tool that actually improves the productivity of you and your employees — within the first hour that you use it.



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"It's straightforward, concise and it works!"

*William A. Andres
Chairman
Dayton/Hudson Corporation*

This computer program was designed by Ken Blanchard and Robert Lorber, co-authors of the One Minute Manager books that have been read by over four million business men and women. PUTTING THE ONE MINUTE MANAGER TO WORK is based on the P-R-I-C-E system for identifying and reaching management objectives. First you PINPOINT an area for improvement, then RECORD the past and present performance measurements. You then INVOLVE your employees in designing action plans, and you systematically COACH them on their efforts. Finally, you EVALUATE your team's progress toward the desired objective.

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CIRCLE READER SERVICE 33

The standard equipment on a Laser 128 is optional on most computers



Take a look at the Laser 128 Apple®-compatible computer, and beginning with its built-in disk drive and 128K RAM of memory, you start to feel that this machine was designed with you in mind. The Laser 128 is ready-to-run — plug it in, insert your program and go. Everything is built-in for you.



Choose from the largest software library in the world. The Laser 128 runs Apple IIe and IIc software, which makes it nice for you and your family, because children can use the same programs at home that they learn on in school. The Laser 128 is a computer for the whole family.

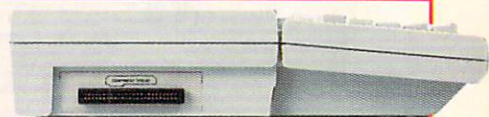


The Laser 128 has built-in interfaces for all

your peripherals, including serial and parallel printer interfaces, modem and mouse interfaces, a game port and you can hookup a



color or monochrome monitor, or even a TV to it. Only the Laser has this much built-in as standard equipment.



It's expandable, too.

The Laser 128 includes an expansion slot to let the computer grow with your increasing demands.

The Laser 128 is priced to keep money in your pocket.

The Laser is about half the price of an Apple, and is even less than a comparably equipped Commodore unit. You get a lot of computer for a little money.



Look for the attractive Laser packaging at a store near you.

For more information on the Laser 128 and the name of your nearest dealer, contact Video Technology Computers, Inc., 400 Anthony Trail, Northbrook, IL 60062, or call (312) 272-6760.



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Manufactured by
VIDEO TECHNOLOGY COMPUTERS, INC.

MAKING COMPUTERS AFFORDABLE

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FAMILY COMPUTING

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12 ELECTRONIC MAIL: TWO STEPS FORWARD

Now there's software that lets you transmit mixed text, graphics, and spreadsheet files via MCI Mail, while you're working with another program. Reviewed: *Lotus Express* for the IBM PC & compatibles and *Desktop Express* for the Macintosh.

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Will a keyboard enhancement such as a mouse or a trackball improve your computing? This guide outlines the features to look for and lists several leading brands.

60 NEW HARDWARE & ACCESSORIES

Epson targets the home/home-office market with a number of new products. Previewed this month: the Apex computer, the LX-800 printer, and the Elite Plus electronic typewriters.

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Design your own colorful patterns on your Adam, Apple, Atari, Commodore, IBM PC or compatible, or Tandy computer with this high-resolution *Fun Graphics* program.*

82 FUN-LEARNING PROGRAM

To celebrate the 200th anniversary of the Constitution, we've developed *Memo-ry Madness*, a program that sharpens memory while you learn historical facts and figures on your Apple, Commodore, and IBM PC & compatible computers.*

89 PUZZLE

Don your thinking cap for this month's back-to-school *Crossword Puzzler*. (See July issue for *Commodore*, *IBM PC & compatibles*, and Tandy program listings, and August issue for *Adam*, *Apple*, and *Atari* versions.)*

NEXT MONTH: SOLUTION TO SEPTEMBER PUZZLE, PLUS DATA FOR A NEW PUZZLE

89 MICROTONES

Put on your dancin' shoes and run *Razz-Ma-Jazz* on your Apple, Atari, Commodore, IBM PCjr or compatible, or TI computer.*

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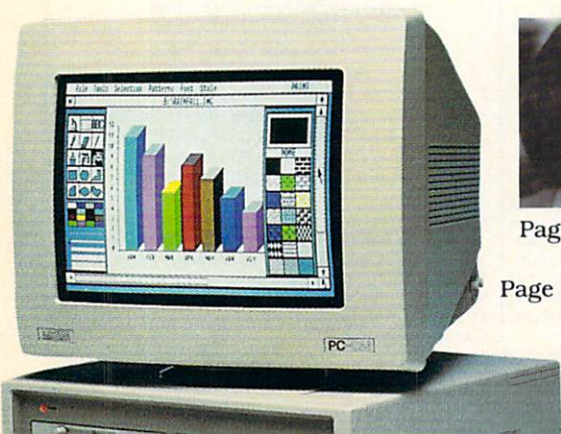
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EDITOR'S NOTE

A QUESTION OF HONOR

In the extremely competitive computer industry, major players constantly seek the elusive winning edge. Details about new products are nearly always highly regarded company secrets, although news inevitably leaks out long before an official release date.

Despite the availability of industry gossip, computer publications want an early first look at a new product—both inside and out—some hands-on experience at the keyboard, and detailed information about specifications, performance, and price. And, of course, the earlier the look, the better.

Newspapers or weekly publications barely blink an eye at new product announcements. They're geared up to handle late-breaking stories and naturally their stock-in-trade is news. (In fact, they're often the ones who find the leaks and publish as much advance information as possible.) They make a press deadline in hours and reach readers the day after an announcement is made. With monthly magazines and longer lead times, it's a different story. Still, these publications hit the stands with news of a new computer just after the official announcement. How is it done? How, for example, did FAMILY COMPUTING manage to feature Tandy's new computers at the same time the company is announcing them to the public?

It's all a question of honor. To ensure the confidentiality of its new product information, a manufacturer draws up a document called a "non-disclosure agreement," and publications agree to abide by its terms.

It was because of just such a document, and a call from Tandy spokesperson Ed Juge, that Technical Director Lance Paavola and Senior Editor Nick Sullivan were able to visit Tandy's Fort Worth headquarters for an early look at the company's two new 1000s—the HX and the TX. They toured manufacturing

facilities, met with engineers, tried out the new computers, and talked with company chairman John Roach. The result of their trip, this month's cover story, "Tandy Strengthens MS-DOS Line," opens on page 43.

We at FAMILY COMPUTING take such agreements seriously. Staff members are told about the confidential nature of the story, and everyone is asked to be careful not to leak information in casual or business conversation. Magazines are not shipped to subscribers until the designated date, and the same goes for advance copies for internal use.

I have a favorite story—that stands out in my mind—about non-disclosure agreements and the importance we give to them. Here it is:

When Apple was developing its IIc, our parent company, Scholastic Inc., was asked to develop software to be demonstrated at the computer announcement. Of course, this arrangement was under a non-disclosure agreement. Still, Apple assumed that FAMILY COMPUTING had seen its new machine's computing capabilities, because we too were owned by Scholastic.

That was not the case, since Scholastic's software division also takes its non-disclosure agreements seriously. But that's not what is amazing about this story. The amazing part is that Debbie Kovacs, who was then creative director of Scholastic's software development, is married to FAMILY COMPUTING's Nick Sullivan (the same Nick Sullivan who visited Tandy). When the time came for us to see the IIc under our own non-disclosure agreement, it was Nick who flew to Apple's offices in Cupertino, California. It was only while there that he got his first look at the program his wife had helped design.

Claudia Cohl
CLAUDIA COHL
EDITOR-IN-CHIEF

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LETTERS

READER SEEKS LEADING EDGE USERS

I am trying to locate a computer users' group near my Southern California home and would appreciate your help. I own a Leading Edge and would like to learn to use it better.

BERNARD BERKOWITZ
West Covina, California

EDITOR'S NOTE: Two we've found in Southern California are the Inland Empire Computer Group (bulletin board [714] 825-4042) and the Inland Computer Users (bulletin board [714] 381-2887). Either one will be able to refer you to an organization closer to home.

For more on how to find users' groups, see our March 1987 "Guide to Computer Repair," page 47.

THANKS FOR ARTICLES ON HANDICAPPED

Thank you for your articles on computers and the handicapped (February and April 1987). I am trying to establish a computer-based education program for developmentally disabled workers in our organization, and your equipment and software coverage is helping me determine what system would be best for our workers.

RICHARD GUTBROD
TRESKO, INC.
Socorro, New Mexico

WILL TV WORK AS MONITOR?

I'm thinking about buying a PC-compatible computer and your March issue was a big help, but I'm also trying to save money and was wondering if I could use my Sony Trinitron color TV (model KV 1362) as a color monitor.

It has what's called a "hit" button where a microcomputer can be connected. Is there a way to use it as both a color monitor and a TV?

KATHLEEN O'REAR
Long Beach, California

EDITOR'S NOTE: It can be done, although your screen resolution will be less than satisfactory with most 80-column software.

For the setup to work, the comput-

er's CGA output must match the television's input. For example, if the TV has an RF (radio frequency) input port, the computer's CGA card must have RF output.

The resolution will be better if the television has a composite video or RGB input port to match your computer's RGB output. Your Sony Trinitron KV 1362 has an RF input port.

DON'T FORGET THE SLOTLESS

Your review of the Commodore 128 in the "Buyer's Guide to Computer Systems" (June 1987) provided some good advice, but you missed a minor point.

You forgot to mention the fact that the memory can be expanded via modules that plug into the cartridge port. For that matter, the cartridge port could actually be referred to as an expansion slot.

You should point out the expandability of those computers without slots, as well as those with them.

GLENN C. LASHER, JR.
Selkirk, New York

DRIVE SOLUTION

I'd like to inform my fellow readers of a problem I had with my disk drive and the solution I found.

I'd set my monitor on a metal stand about four inches high and placed my disk drive underneath it. I found that I could not load certain programs.

After asking friends and searching every avenue for a solution and checking head alignment, cable connections and repair services, I decided that there must be something wrong with the physical setup.

After removing the drive from beneath the monitor (and from the monitor's magnetic field), everything worked fine.

DANIEL E. JOHNSON
Nashville, Tennessee

IN THE SAME BOAT

About two years ago, I was in much the same situation as Roy C. Miesse III of Lititz, Pennsylvania (Letters, "The Great Computer Search," June 1987).

I started looking at computers

mainly because I needed to keep up with my 10-year-old twin girls who were taking computer classes in school. I quickly learned that computers had changed quite a bit since I had been involved with them in the late 1960s.

I asked friends and relatives for their advice; visited local retail stores to see what was available; and even "borrowed" a friend's computer and ID number and shot a general query into one of the national electronic networks.

I finally made a purchase and have basically been happy with my decision, but I would make two recommendations to Mr. Miesse:

1) Consider all available information, then make your own decision (FAMILY COMPUTING being one of the best sources that I've found for this information).

2) Give definite weight to the availability of local support, either from a dealer or users' groups, especially if you live in a small community, as I do. This is something I wish I had considered earlier.

TOM HOCKER
Gallup, New Mexico

CORRECTIONS

The RBBS-PC (Remote Bulletin Board System for PC) is \$6 for each of the four disks, not \$6 for the entire set as mentioned in the IBM Machine Specifics column in the May issue. Write or call: PC-SIG (1030 East Duane Avenue, Suite D, Sunnyvale, CA 94086; [408] 730-9291 or [800] 245-6717).

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HOME OFFICE

ELECTRONIC CALENDARS, CALCULATORS, NOTEPADS, AND DICTIONARIES

Put Them Inside Your Computer and Eliminate Desk Clutter

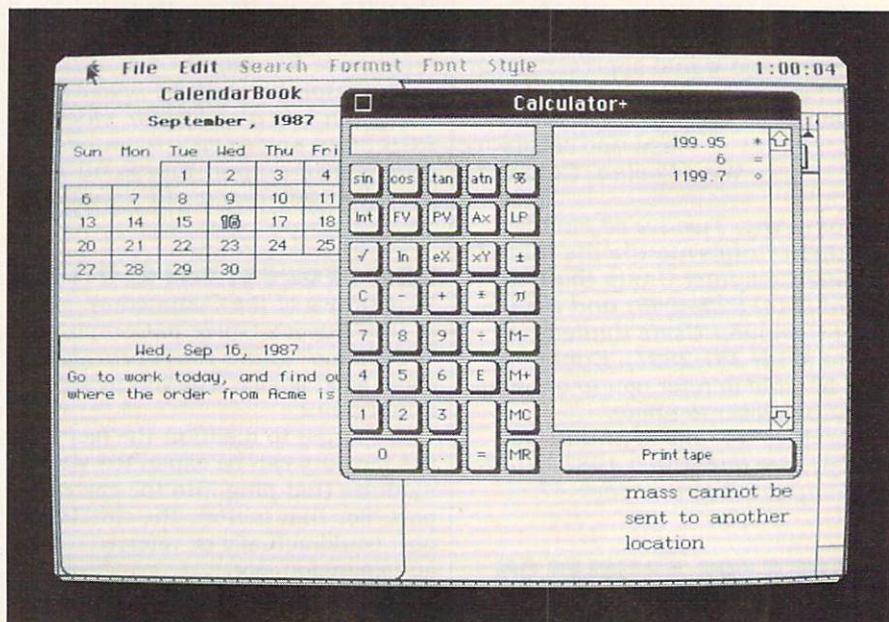
BY MATTHEW STERN

Calendars, calculators, notepads, dictionaries, and even phone lists: They're handy things to have on your desk but take up space and can make your desk look like the ruins of Pompeii. You can make these accessories more accessible by putting them all in one convenient place: inside your computer.

Electronic desk accessories are programs that you can call up while using another application package. If you're writing a letter, you probably don't want to close or save your document just to add a few numbers, jot down a few scratch notes, or revamp your calendar. With an electronic calculator, notepad, or calendar in your computer, you can do your scratch-pad work and return to your main application with just a few quick keystrokes.

The Apple Macintosh popularized desk accessories because the machine was designed with a special menu and a "holding place" for them (see this month's "Machine Specifics" for a sampling of shareware/desk accessories). Every time you load the System disk you load accessories, and you can add and remove them as you wish. You access them by pulling down the menu behind the Apple insignia in the bar atop the screen.

On computers whose operating systems aren't designed for such desk features, like the MS-DOS models, you load the accessories from disk and then load your main application, such as a word processor or spreadsheet. (Check each program's documentation to make sure you have enough memory for two programs and your files.) Because all or part of the program is in active RAM and doesn't have to be loaded from disk, you can access it almost imme-



Shown on *SideKick* (Borland International) on the Macintosh are the *Calculator* and part of the *Calendar* as they appear on-screen. You can choose either option from a menu without leaving your applications program.

diately. For instance, *SideKick* on the IBM PC comes up when you simultaneously press the ALT and CTRL keys. (On most accessory programs, you can alter the key sequences if they conflict with other programs.) Press ESC at any time, and you return to your normally scheduled program.

Here's a brief description of the major desk accessory software.

SIDEKICK

Borland's *SideKick*, the first major desktop accessory for the IBM PC, offers a number of utilities in a single package (for Apple Macintosh, \$100; for IBM PC and compatibles, \$85). The MS-DOS version of *SideKick* offers a calendar, calculator, notepad, automatic phone dialer, and complete ASCII character chart. The Macintosh version also includes an outliner, 'phone-link' hardware that acts like a modem, and, amazingly enough, a spreadsheet with graphics capability.

The calendar records your appointments and will store dates well into the next century! Say you're in the middle of a spreadsheet, and you get a phone call from someone want-

ing to schedule a meeting for next month. With two quick keystrokes (IBM version) or a click of the mouse (Macintosh version) you bring up the *SideKick* menu. Choose Calendar from the menu, and suddenly you're looking at September's calendar. Type in the date in question, and you see a sheet with an appointment line every half hour.

Another product, *Smart Alarms and Appointment Diary* (Imagine Software; Macintosh, \$50) will even ring a bell to inform you of an appointment, birthday, or any other engagement.

On *SideKick*, you could exit the calendar or keep it on screen and call up the calculator. You'd now see on your screen a piece of your spreadsheet, a piece of the calendar, and a full-fledged calculator. It's starting to look like your desk!

The calculator performs basic arithmetic tasks. Programmers will like the calculator's binary, hexadecimal, decimal, or scientific notation. You can move the result of any calculation into another part of *SideKick* or any other application.

The Notepad serves as a mini-word processor. You might use it when in-

MATTHEW STERN's last article for FAMILY COMPUTING was "Your Money and Your Mac" in the June issue. You can reach him on the FAMILY COMPUTING Forum on CompuServe (ID: 73547.2420).

IT'S A FAX. IT'S A PHONE. IT'S A COPIER.



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HOME OFFICE

side a database or spreadsheet to make quick notes or even when you don't want to save a word-processing document and open another. These notes can later be loaded into another document or printed immediately.

Finally, if you have a modem, you can use the Dialer to call and check your electronic mail, saving yourself the trouble of exiting one application and loading your communications program.

Travelling SideKick (Borland; \$70) is an old-fashioned desk accessory—a black leather notebook. Before going on a trip, you can print out your calendar and any notes from *SideKick* and carry them with you.

METRO

In the last few years, a host of other companies have brought out general-purpose desk accessory programs. *Metro* includes a text editor, calculator, phone book with auto-dialing feature, a stopwatch (with alarm), and notepad (Lotus; for MS-DOS computers, \$85). *Metro* also lets you assign a number of key-strokes to a two-key sequence (a macro generator) and provides a clipboard for transferring text between two applications programs.

Pinpoint (Pinpoint Publishing; Apple IIe/IIc/IIgs, \$89) is a desktop accessory designed primarily to work with *AppleWorks*. While *Pinpoint* can function with 128K, you ideally want more memory. *MaxPack* is a general-purpose desktop accessory for the Atari ST (see *August Machine Specifics*; SoftWerx, \$50).

The Commodore version of Timeworks's *Partner* comes on a cartridge and includes an appointment calendar, memo pad, automatic phone dialer, address and phone book, calculator, typewriter, label maker and screen-print function. To call up the accessories while using another program, you press the white button on top of the cartridge (Timeworks; C 64, \$60; C 128, \$70; IBM PC, \$60).

The GEOS operating system for the C 64/128 (Berkeley Softworks; \$60) comes with a calculator, an alarm clock, and a notepad. With Berkeley's *Deskpack I* (\$35), you can add a calendar, an icon editor, an Art Grabber (which converts graphics to *geoPaint* format), and even a blackjack game.

Write Hand Man (distributed by Elliam Associates, \$50) runs under CP/M on Adam, Kaypro, Epson, Morrow, Osborne, and Sanyo computers and includes a calculator, notepad, phone book, and calendar.

DICTIONARY AND THESAURUS

Thunder! is a real-time spelling checker that beeps when you misspell a word (Electronic Arts; Atari ST, \$40; Macintosh, \$50). Select the *Thunder!* dictionary, and it shows you a number of possible correct spellings. Either click with the mouse on the correct word or save the word to the dictionary if it's a proper noun or other nondictionary term that you use often.

You can test a word's spelling before you write it. Just click the "test" button and type the word you want to check. If the word isn't in the dictionary, *Thunder!* will list alternate correct spellings. *Thunder!* can be programmed to automatically replace abbreviations with complete words. For example, I used the words *desktop accessories* many times in this article. Rather than retype them each time, I told *Thunder!* to replace the letters "da" (with a space on either side) with *desktop accessories*. Thus, *Thunder!* saves typing time.

Finding the correct word is as important as finding a correctly spelled one. Borland's *Turbo Lightning* is a spelling checker that includes an on-line thesaurus (for MS-DOS computers, \$100). Call it up, and *Turbo Lightning* shows you a list of synonyms. (When used with a graphics-oriented program such as *Microsoft Word*, *Lightning* and other text-oriented accessories may cause the screen to freeze up.) If it can't find the word you selected, the program lets you choose a word that is close. Select the word you want, and it's automatically inserted into the document.

Many word processors, of course, now include an automatic spelling checker and thesaurus. The advantage of programs such as *Thunder!*, *Turbo Lightning*, and *Mac Lightning* (Target Software; Macintosh, \$100) is that you can also use them with other programs, such as spreadsheets or databases.

POST-IT

Another common desk accessory is similar to the yellow Post-It notes


you see stuck to memos and reports. *Smart Notes* allows you to attach "notes" to text files from spreadsheets, databases, word processors and other programs (Personics; MS-DOS computers, \$80). Access *Smart Notes* and jot down your message, and it can be attached to certain characters on your screen. When you call the file up again, you will see the note exactly where you placed it earlier. However, the *Smart Notes* program must be resident in memory in order for the note to appear.

Memorandum (Target Software; \$100) is a similar "Post-it" program for the Macintosh.

PERFECT HARMONY?

Besides the above-mentioned electronic desk accessories, there's a growing list of other programs you can hide inside your computer. For instance, *Lotus Express* is a memory-resident communications program for the IBM PC (see this month's "Telecomputing" department). *Acta* (Symmetry Co.) is an outlining program for the Macintosh. As computer operating systems get more sophisticated and memory increases, this trend will likely continue.

While desktop accessories are right at home on the Macintosh and Atari ST, getting several to work well together on the IBM PC can be difficult, if not impossible. If you mix and match programs from different developers, you'll have to experiment.

By transforming your frequently needed and used desktop tools from physical objects into electronic accessories, you keep them at your fingertips. It's just another way to make your computer more productive while keeping your desk neater. 

SOFTWARE PUBLISHERS

Berkeley Softworks (415) 644-0883; Borland International (408) 438-8400; Electronic Arts (415) 571-7171; Elliam Associates (818) 348-4278; Imagine Software (415) 453-3944; Lotus Development Corporation (617) 577-8500; Personics, Inc. (617) 897-1575; Pinpoint Publishing (415) 654-3050; SoftWerx (801) 272-5623; Symmetry (602) 844-2199; Target (305) 252-0892; Timeworks (312) 948-9200.

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PERSONAL FINANCE

BE YOUR OWN STOCK ANALYST

A Review of *Value/Screen Plus*, a Stock-Investment Database for IBM PC and Macintosh Owners

BY ANTHONY GUARDINO

For most of the 1980s, it's been a bull market on Wall Street. No one seems to blink an eye these days when the Dow Jones Industrial Average jumps 40, 50, or even 60 points or when 200 million shares of stock trade hands in one six-hour period.

Because of the new highs that have hit the stock exchanges, a record 47 million individual investors are now playing the market. Many of these people choose stocks based on advice from stockbrokers or from friends and family members. But others spend a considerable amount of time analyzing the market, crunching numbers, and picking stocks on their own.

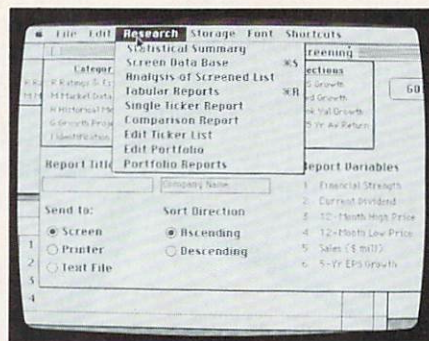
The personal computer has evolved into one of the most powerful tools for these investors who make their own decisions. A computer and the appropriate investment software can perform investment evaluations that are either too time-consuming or too complicated to do manually.

ADVICE FROM THE PROS

One program for owners of a 256K IBM PC or compatible or a 512K Macintosh that provides a system for selecting stocks and analyzing investment performance over time is *Value/Screen Plus*. This stock-investment database package was developed by Value Line, a financial organization best known for its *Value Line Investment Survey*—a leading investment advisory publication that provides investment advice and reference information for most actively traded public companies.

Value/Screen Plus includes a master program and one data disk of financial records from Value Line's current database of more than 1,600 stocks, which is evaluated and maintained by Value Line's staff of professional securities analysts. Updates of this data are provided monthly or quarterly, depending upon the subscription you choose.

You have three subscription op-



The Macintosh version of *Value/Screen Plus* takes full advantage of the Mac's pull-down menus. All of the principal functions of the program are accessed through the Research menu.

tions: The first subscription plan allows users who have modems to receive monthly data updates electronically. The total cost of this option, which includes the program, is \$396. The second subscription option costs \$348 and is similar to the first, except that the monthly updates arrive by mail on data disks. Less active investors are likely to choose the third option, which provides quarterly database updates on disk for a one-time fee of \$95 for the software and \$29 for each update. The total cost for the first year is \$211.

INSIDE THE DATABASE

Value/Screen Plus's database is comprised of 37 investment variables divided into four categories: growth projections (projected dividend growth, for example), historical measures (for instance, company revenues), market data (12-month high price of a share of stock, for instance), and ratings and estimates (for example, financial strength of a company).

You can use seemingly endless combinations of these variables to screen the database for those stocks that satisfy your specific investment criteria. After the program executes your screening request, you see in the database the number of stocks that satisfy your requirements. You can then either view the names of these companies or narrow down the

list even further by adding more variables.

A simple screening could, let's say, provide a listing of publishing companies with a 12-month stock high of \$40 or less, and a five-year annual growth rate per share of at least 10 percent.

Value/Screen Plus also lets you generate tabular reports for any number of stocks listed in the database. Report formats may vary from the simple alphabetical listing of their ticker symbols (for example, GenEl for General Electric) to complex reports containing as many as 20 columns of statistical data.

Finally, *Value/Screen Plus* provides a simple portfolio manager that can be used to evaluate a list of selected securities. A maximum of 75 stocks can be entered in a single portfolio list.

Value/Screen Plus comes with a well-indexed, easy-to-understand manual. Helpful reference information, including definitions of all financial variables, also comes in the documentation. In addition, help windows are available throughout the program to further describe the operations and procedures.

Despite its ease of use, the package isn't suitable for everyone. If you have a \$2,000 inheritance that you want to invest in the market, but you don't know how to read a stock index, you should get your advice from a full-service stockbroker; this database is for people who have a basic understanding of the stock market, or at the very least, plan to learn about the market.

But for anyone who invests fairly regularly in the stock market, *Value/Screen Plus* is a powerful and sophisticated tool to help you make smart investment decisions without the costs of a full-service broker. Within a short period of time, you can be analyzing stock-market data like a Wall Street professional. ☐

Available from Value Line Software, 711 Third Avenue, New York, NY 10017; (800) 654-0508 or (212) 687-3965.

ANTHONY GUARDINO is a freelance writer living in New York.

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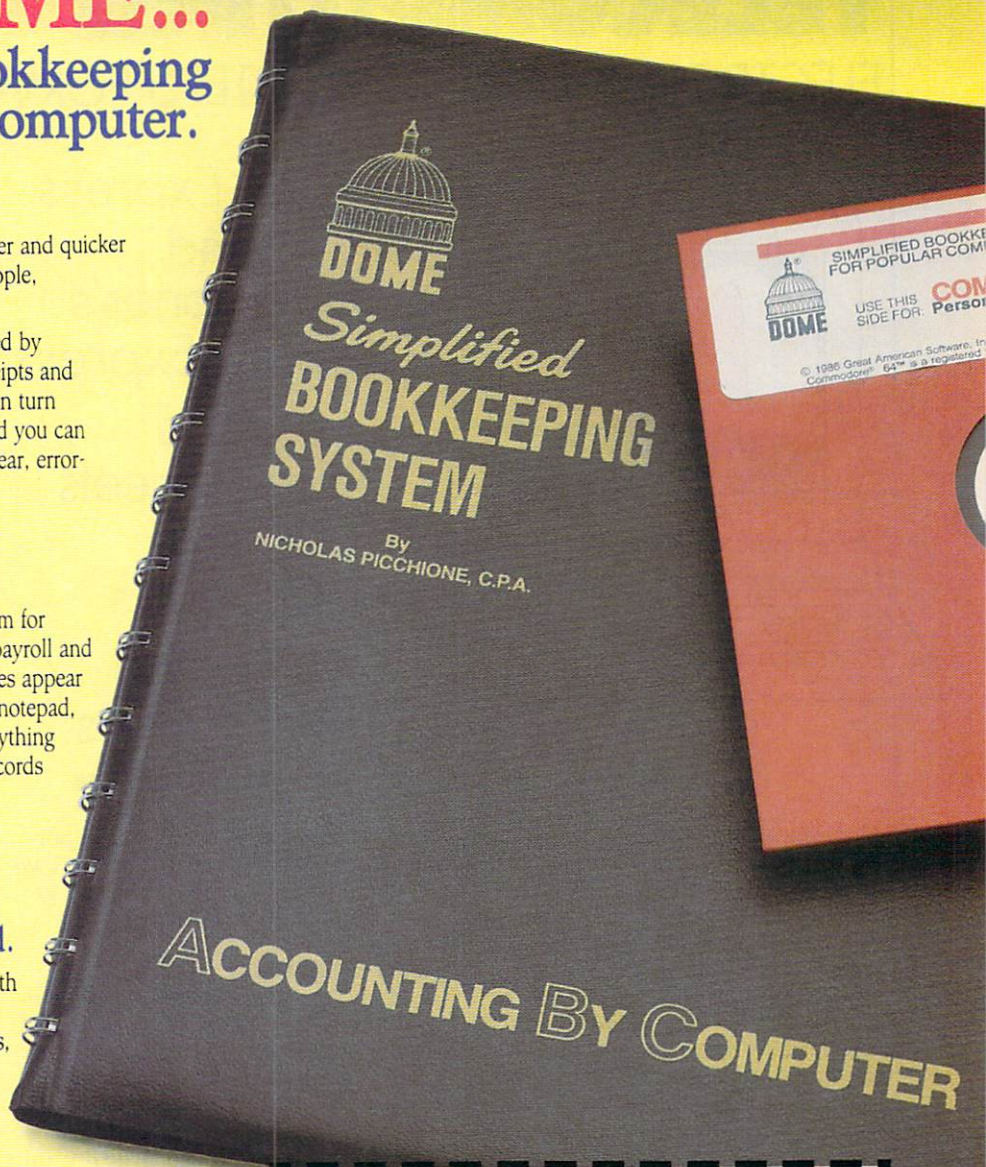
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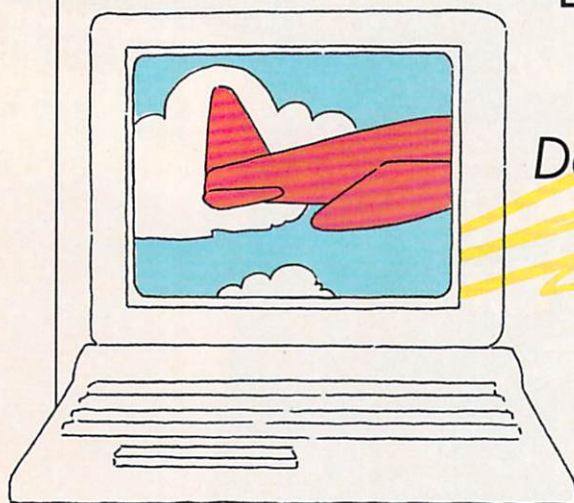
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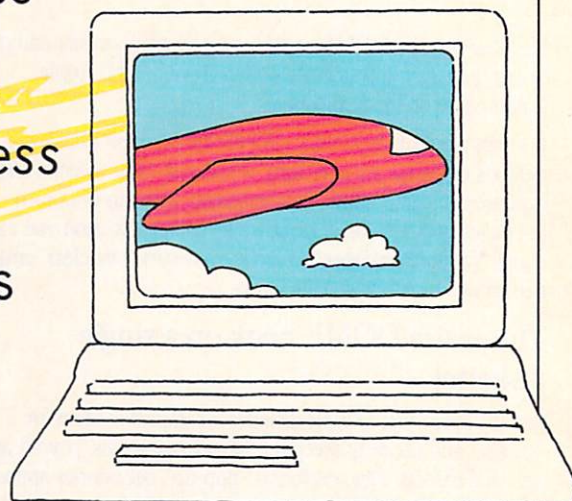
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TELECOMPUTING

ELECTRONIC MAIL: TWO STEPS FORWARD



Lotus's *Express*
and
Dow Jones's
Desktop Express
Send
Spreadsheets
and
Graphics
Over the
Phone Lines



BY NICK SULLIVAN

The ideal: Everybody you know has a computer, a modem, and an electronic mailbox. That would make electronic mail better than the telephone in a lot of ways. You could fire up your modem and send a letter, spreadsheet, or picture to anyone you chose. The document would get there instantly and *much* more cheaply than it would via an overnight mail service. The other person could retrieve it any time, and you wouldn't have to spend days trading messages on your telephone answering machines. A win-win situation.

The reality: Though most businesspeople use a computer, not everyone who has a computer has a modem. Not everyone who has a modem has an electronic mailbox. And not everyone who has an electronic mailbox checks it regularly. Thus, the telephone is still the better and preferred mode of business communication. It's easier to use and is ubiquitous.

But the outlook for electronic mail is improving. There are now 5 million electronic mailboxes in North America, and 3.7 million of these belong to internal systems set up by corporations for their employees.

But making e-mail easier to use—

and more *useful*—is just as important as achieving critical mass. Two new software products take two giant steps in that direction.

MCI SPECIALS

Both *Desktop Express* (for Macintosh) and *Lotus Express* (for IBM PC and compatibles) were developed in conjunction with MCI Mail and bring new functionality to the service. MCI Mail ([800] 424-6677 for information) is not the largest public service, but has always been a leader. It was the first to offer laser-printing sites, enabling computer users to electronically send documents to anyone with a postal or tel-ex address. It was the first to link nationally with another service, CompuServe. Now subscribers to either service can send messages to the other—a pool of about 500,000 users. In addition, MCI is also linked to IBM's PROFS and DEC's ALL-IN-1 in-house electronic mail systems, and it allows you to send mail to 1.8 million telex users.

Finally, MCI Mail is inexpensive. A subscriber pays \$18 a year and \$1 for most messages, whether it takes one minute or 30 minutes to compose and send each one. Retrieving messages is free.

But MCI Mail, like most electronic mail systems, has been a text-only system. You could send any file

stored in ASCII format (a text file), but not a binary file. You could not use the standard file-transfer protocols, such as XModem, for computer-to-computer communications. That meant no spreadsheet files intact with formulas, no graphic presentations, and no files that mixed text and graphics. In the age of desktop publishing, this limitation is crippling.

All that has changed with the new software from two of the major players in the computer industry, Lotus and Dow Jones. In an interview with *FAMILY COMPUTING* last year, Bill Dunn, president of Dow Jones's Information Services Group, said, "The piece of paper with the information is what people want. They don't want to search for information or download it and then calculate it. They want to push a button and see it." Now, Lotus chairman Jim Manzi says that the new developments will help make "instant electronic communications an everyday event." Both are working toward the same goal—making electronic mail as useful as the telephone.

DESKTOP EXPRESS

Send Mac Graphics and Documents
PUBLISHER: Dow Jones & Company Inc.; (800) 257-5114
PRICE: \$149
HARDWARE REQUIREMENT: Macintosh

NICK SULLIVAN, a senior editor for *FAMILY COMPUTING*, often writes articles for the *Telecomputing* department.



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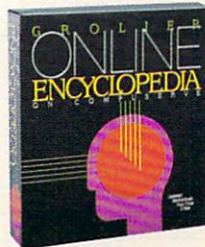
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TELECOMPUTING

Desktop Express, developed by Dow Jones, Apple, and MCI Communications, allows you to send graphic documents created on the Macintosh, be they complete newsletters or single images, to remote locations via MCI Mail. Using the ImageSaver function (a camera icon you store in the System Folder) you can save any on-screen image and send it. Any *MacPaint* file can also be sent.

The recipient then signs onto MCI Mail with *Desktop Express*, downloads the image, and views or prints it, even if the program that created the file is not available. If the recipient does not have a computer, the mail will be laser-printed at an MCI print site and delivered via courier or the U.S. mail.

You can also send *Excel* worksheets to other *Desktop Express* users or to Lotus *Express* users. Because *Excel* is file compatible with 1-2-3, the work sheet can be transferred back and forth between the Macintosh and an IBM PC.

Besides bringing added practicality to MCI Mail subscribers, *Desktop Express* is pleasing to use. When we first tried it at the office it took five or six tries to successfully send our first image. But with just a cursory look at the documentation, we navigated easily by mouse-clicking on various icons. They are clear enough to lead you through most procedures, and some are even artistic (a Michaelangellesque icon of two fingertips touching is highlighted when you connect to MCI Mail).

Later, you see a more practical on-screen graphic. When your image is being sent to another mailbox, a me-

ter (0-100 percent) shows what percentage of the file remains to be sent. This gives you an idea of how long it will take to send the image.

You can do more with *Desktop Express* than send graphic images via MCI Mail. You can use it as a standard communications package to sign onto MCI Mail and Dow Jones News/Retrieval, and you can, of course, send straight text files. A mini-word processor allows you to compose letters to send on-line. Finally, you can set up *Desktop Express* to automatically sign on to Dow Jones News/Retrieval and download stock quotes or other financial information. If updates of the program are developed, they will probably be available on-line.

With *Desktop Express*, it's possible to electronically distribute a *PageMaker* or *Ready-Set-Go!* newsletter or presentation, much as newspapers are satellite-delivered around the world. That's a big step forward for electronic mail.

LOTUS EXPRESS

It Whistles While Your IBM Works
PUBLISHER: Lotus; (617) 577-8500
PRICE: \$100
HARDWARE REQUIREMENTS: IBM PC, Compaq, AT&T, (256K for DOS 2.0 and 2.1; 320K for DOS 3.0 and higher; 640K to run with another program); Hayes or compatible modem; hard disk recommended.

On one level, *Express* is just another communications package. Then again, it's the first IBM PC package that allows you to send binary files (such as 1-2-3, *Freelance Plus*, or

Symphony files) to MCI Mail. These files can be downloaded and used by another person with *Express*. And a Macintosh user with *Desktop Express* can receive 1-2-3 files.

On another level, *Express* is just another memory-resident package that can be loaded into your computer along with another program, such as a word processor. Then again, *Express* operates automatically and independently, so it effectively turns the IBM PC into a multitasking computer. Included in the purchase price is a one-year subscription to MCI Mail; if you're already signed up, your subscription will be extended.

Express completely automates all communications procedures, minimizing the need for user intervention. In so doing, it takes the drudgery and time out of electronic mail and may solve a major problem—getting people to pick up their messages.

How exactly does *Express* work? *Express* can automatically sign onto MCI Mail and download your messages while you continue working on another program, such as 1-2-3. A beep alerts you when mail has been received. Without leaving your spreadsheet, you can call up *Express* and read or print out your mail. *Express* can also be used alone, which is fortunate, because *Express* is somewhat finicky about its operating environment.

You need 640K to use *Express* along with another program, though *Express* won't work with another program that requires 512K, such as *Manuscript* or *Framework*. *Express* will not "launch" from operating environments such as Windows or XTREE. *Express* will not work with *Turbo Lightning*, though it does work with *SideKick*. And only versions 3.06 and higher of *XyWrite III* will work concurrently with *Express*.

Finally Lotus has only tested *Express* on the IBM PC, AT&T, and Compaq computers. The company confirms that the program doesn't run on the Leading Edge Model D or the Tandy 1000 computers. So look before you leap into buying this program for your computer.

Despite these shortcomings, *Express* is a breakthrough product in the MS-DOS world and a major step in the continuing evolution of electronic mail. ☐

TOP PUBLIC ELECTRONIC MAIL SERVICES

Service	Mailboxes	Messages Per Month
AT&T Mail	20,000	400,000
CompuServe (InfoPlex)	32,000	800,000
CompuServe (EasyPlex)	330,000	1,100,000
General Electric (Quik-Comm)	70,000	1,500,000
General Electric (GENIE Mail)	40,000	150,000
General Videotex (Delphi)	35,000	140,000
McDonnell Douglas (OnTyme)	60,000	1,300,000
MCI Mail	90,000	1,800,000
The Source	65,000	1,400,000
Western Union	155,000	7,500,000

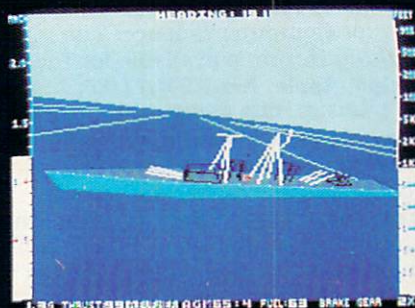
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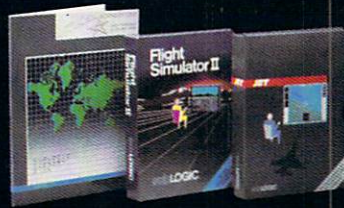


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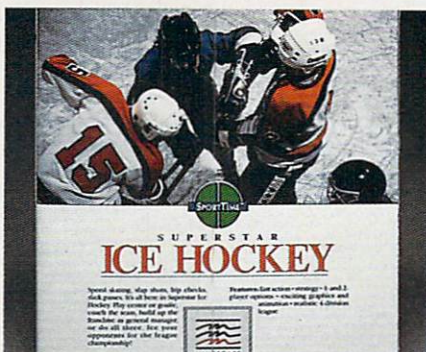
HINTS, NEWS, AND NEW GAME FORMATS

Each month, this newly revamped department will bring you news and information about the latest (and future) games, gaming trends, and the availability of new formats, as well as tips for solving your favorite games. And don't miss our monthly reviews in the "Software Reviews" section.

WHAT'S NEW, AND WHAT'S RUMORED?

★ Daytime game-show fanatics can fulfill their dreams of becoming contestants on three of the most popular games on TV. **ShareData** has released three new computer games, *Jeopardy*, *Wheel of Fortune*, and *Family Feud*, modeled after the TV shows of the same names. (Of course, prizes aren't included in the package.) ShareData's games cost \$10 each and are available for the **Apple**, **C 64/128**, and **IBM PC**.

★ When **FAMILY COMPUTING**'s editors aren't on deadline, they often get together for a game of golf, basketball,



or some other sport—on the computer, of course. Lucky for us, game playing comes with the job. Next on our list is **Micro League Sports Association's** new *MicroLeague Baseball II*. We hear it contains many new elements—stadium dimensions and factors, injuries, arguments with the umpire, rain delays, pitcher stamina and tiring factors, and a stat compiler—that weren't included in its predecessor, *MicroLeague Baseball*. **Atari ST** owners should already be able to get their hands on *MicroLeague Baseball II*, and it will be released this fall for the **Amiga** and **Macintosh**. . . . Face off along with the hockey pros in **Mindscape's** *Superstar Ice Hockey*, a computer

hockey simulation. *Super Ice Hockey* lets one or two players battle the computer, battle each other, coach a team, or manage a league. The play is so realistic that the players even age over the course of nine seasons. *Ice Hockey* is available now for the **C 64/128** and **IBM PC/PCjr** and will be available in early fall for the **Apple**.

★ **G.U.E.**, the university setting of **Infocom's** new interactive adventure, *The Lurking Horror*, was modeled after **M.I.T.**, according to a source at Infocom. In fact, the company was started by M.I.T. grads, and we learned that **Dave Lebling**, author of *The Lurking Horror*, attended the university and worked at its Laboratory for Computer Science. *The Lurking Horror* is available for the **Amiga**, **Apple**, **Atari 800/XL/XE**, **Atari ST**, **C 64/128**, **IBM PC/PCjr**, and **Macintosh**. . . . **Joan Rivers**, while interviewing **Infocom's** *Bureaucracy* co-author **Douglas Adams** on her late "Late Show," called *Bureaucracy* "the funniest computer game ever." To create this "misadventure," Adams drew on his own battle with red tape.

★ **Electronic Arts** has a new line of \$20-\$25 games called **Amazing Software**, targeted specifically at action-adventure, arcade-oriented game enthusiasts (a.k.a., people who don't like reading manuals). The first product release is *Dan Dare: Pilot of*



Dan Dare is available for the **C 64/128**.

the Future, based on the adventures of **Dan Dare**, a famous comic book character from England. Like a comic book, the game uses funny captions, color cartoon graphics, and fistfights. **EA** plans to release six new titles, including *Sanxion*, *Delta Patrol*, and *Dragon's Lair*, under the

Amazing Software label before the year's end. . . . You may not have heard that **EA** teamed up with legendary test pilot **Brigadier General Chuck Yeager** to create an all-new flight simulator that lets you fly one of 14 different aircraft and teaches basic flying skills, advanced maneuvers, and acrobatic stunts. *Chuck Yeager's Advanced Flight Simulator* is now available for the **IBM PC/PCjr**, and a **C 64/128** version is planned.

★ **Amiga**, **Atari ST**, **C 64/128**, and **IBM PC/PCjr** owners can get behind the wheel of one of the world's top sports cars: Climb into a **Ferrari Testarossa**, a **Lamborghini Countach**, or a **Lotus Esprit Turbo**. With **Accolade's** *Test Driver*, the first driving simulation we've ever come across, you zip through different sections of a highway while avoiding slower traffic and the highway patrol. . . . Or **C 64/128** owners can leave the roads behind and blast off to the moon in another **Accolade** simulation called *Apollo 18: Mission to the Moon*. Graphics based on actual footage of the Apollo missions and digitized voice and sound help re-create the original moon missions of the 1960s.

★ **Epyx** shipped in surfboards, Frisbees, and a palm tree to the south side of Chicago—where the last Consumer Electronics Show was held—for its introduction of **California Games**. "What gnarly games are Californian?" you might ask. This program has bike-racing, surfing, skateboarding, roller-skating, flying-disk, and foot-bag competitions. It should be on store shelves now for the **Apple**, **C 64/128**, and **IBM PC/PCjr** and will be available soon for the **Amiga** and **Apple IIcs**. . . . **Epyx** also showed us *Street Sports Baseball* and *Street Sports Basketball*, the first titles in its new **Street Sports** line of games—for those who couldn't care less about the glamour of the big leagues. *Baseball* is now ready for **Apple**, **C 64/128**, and **IBM PC/PCjr** owners.

GAME HINTS

BLACK MAGIC. Datasoft. In this strategy/arcade game, your mission is to collect the six eyes of a lost statue and restore the eyes to their

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ENTERTAINMENT

rightful positions. Then, defeat the evil wizard, Zahgrim, and win the love and devotion of the whole kingdom. (Apple, C 64/128)

★ Before taking an eye, clean out the Prisoner's Keep. Destroy all the plants and collect all the prisoners you come across. (This should give you nearly enough experience to reach the second level.) Then go through the town and down the ladder to get to the other eye. Fall down the pit and clean out the rest of the complex. Finally, cross the cemetery and loot the next dungeon.



Collect the eyes of a lost statue.

★ By casting a Vanish spell, you can fall a great distance without dying.

★ If your aim is good, stalactites may be used to block demons that are chasing you.

★ When you have reached the second or third level—where the dungeons are crawling with bad guys—be sure to cast a Chill spell before blinking to another part of the screen.

★ The Conjure spell won't work in some parts of the cemetery or in the Caves of Courage.

★ It's usually not worth your while to summon arrows. Instead, take the health or food.

★ Buildings in town may be set on fire by hitting them with a single arrow. You can get rid of many demons and ghosts with a few arrows.

★ Make a general map of the locations of the eyes. You don't want to waste time wondering where you're going.

★ Food is depleted at regular intervals; if you don't have food, your health declines. Also, the longer you

go without food, the faster you will use up any new food you find.

★ When you're deep underground and out of arrows, the bird can be your best friend. However, the bird can appear during awkward moments, so practice scaring it away with your arrows. The same guidelines apply to trolls. —JEFF DONAHUE

ROADWAR 2000. SSI. Travel the savage roads of the future, looking for eight scientists who can find a cure for the plague. Combat with rival gangs is resolved either in a graphic, but slow, strategic mode, which gives the player complete control, or in a quicker mode, in which the computer controls both sides. (Amiga, Apple, Atari ST, C 64/128)

★ When first starting out, try to stay in regions with the fewest mutants (areas far away from the devastated cities), most notably the Northwest.

★ California is also a good starting location because its numerous cities afford many opportunities to loot and recruit men. Most of these cities are small and relatively easy to take over. Also, try to take control of cities that don't have invaders in them.

★ The best time to fight strategic battles is when you are first starting. You'll want the experience, and these fights are short, as few vehicles are involved.

★ Strategically fight motorcycle gangs and the 'Hardhats' because both groups are easy to defeat, since each vehicle carries only two to three men.

★ Shooting out tires is an effective fighting technique. It works especially well against buses, which have only six tires but over 50 interior crew members. It's even easier to shoot out the 18 tires of a trailer truck than it is to kill every interior crew member.

★ A drill sergeant is a must and is the most important of the three cronies (doctor, politician, and drill sergeant). If you have a drill sergeant, the increase in the number of promotions among your crew is astonishing. Within a few battles, you'll have an effective fighting force. You'll find a drill sergeant in Colorado

Springs; it could take much longer to find one by searching other cities.

★ Scout every city you pass through. Sometimes a city isn't controlled by anyone, and you can take over without a fight. You'll also want to know before you start looting if a particular city is controlled by lawful national guardsmen.

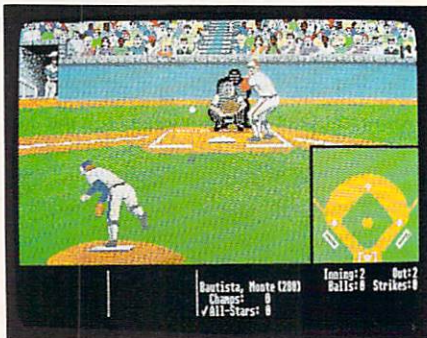
★ Don't go to Detroit until you have a number of good vehicles. The first time you go to Detroit, you'll automatically receive additional speed, braking, acceleration, and armor for all of your vehicles.

★ Once you know the location of GUB, go there to receive the badge, and you'll be able to find scientists. However, you don't need the clue to find a scientist. Occasionally, you'll luck out and stumble across one.

★ If you're ever running short of food—and you don't think you'll find any quickly—send all your escorts (and dragoons, if necessary) to scout. Most of them won't return, and you'll then be able to stave off starvation a little longer and preserve your best men.

—DAVID LANGENDOEN

HARDBALL! Accolade. Choose from an array of pitchers and hitters and hit and field your way to victory in this fast-paced baseball simulation/arcade game. (Apple, Atari 800/XL/XE, Atari ST, C 64/128, Macintosh)



Hardball!, a fast-paced simulation.

★ If you're playing the computer and have runners on second and/or third base or runners on first and third, bunt. The computer will react by throwing the ball to the base that has the lead runner and will then throw to first base to try to get the out. However, all but the slowest runners will have time to beat the throw and get on base.

Nobody's Perfect...

Game	Winner	Time to Move
1	SARGON III	5 seconds
2	SARGON III	5 seconds
3	SARGON III	15 seconds
4	SARGON III	15 seconds
5	SARGON III	30 seconds
6	Chessmaster	30 seconds
7	SARGON III	3 min
8	SARGON III	3 min

YOU CAN'T WIN THEM ALL.

We pitted Sargon III, the world champion, against the challenger. Head to head, with no punches pulled. And believe it or not, the champ lost one game to the challenger. But Sargon III beats Chessmaster 2000 almost everytime.

Sargon III is the result of more than twenty one man years of development. Sargon III will play at precisely the level of difficulty you desire. Ask Sargon III for a hint, take back a move you've already made, replay a sequence, change sides, or set up your own board for customized learning. Sargon III lets you study in detail more than 100 great games of history or review 45 classic chess problems,

all on screen. Sargon III also includes the largest library of opening moves available on any chess program.

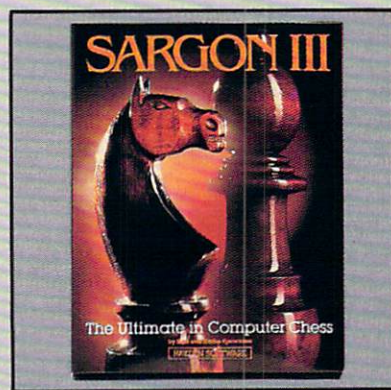
SARGON III WRITES CHESS HISTORY

In a tournament sanctioned by the U.S. Chess Federation, Sargon III beat

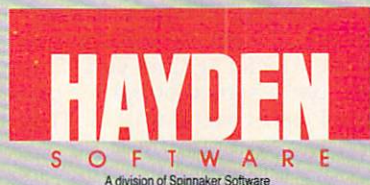
a master rated 2209. That makes Sargon III the only microcomputer program ever to defeat a player at that level.

Sargon III has no trouble wiping Chessmaster 2000 off the globe. Someday, maybe a chess playing program will be able to beat Sargon III. Until then, which chess program do you want to own: the world champion or the runner-up?

(Note: The test was run on two Apple II computers. Each program played once as white and once as black at each level. Send us \$5.00 for handling, along with a postage paid return envelope and we'll send you a copy of the moves each side played.)



Sargon III is available for: Apple II series, Apple Macintosh, IBM PC and Commodore 64/128 computers. You can find Sargon III at your local retailer or call 1-800-826-0706. Illinois residents call 1-800-826-1330. Only MasterCard, VISA and American Express accepted for phone orders.



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CIRCLE READER SERVICE 34

ENTERTAINMENT

★ When a ball is hit into the outfield and drops for a hit, throw the ball to the closest base rather than to the base you think the hitter will reach. If, for example, a ball is hit into right field and you think it will be a triple, throw the ball to first base and then across to third. The ball will reach third much quicker, and you might even throw the runner out. The exception to this is that if you want to throw home, throw directly home. —DAVID LANGENDOEN

BALLBLAZER. Epyx. Maneuver around the playfield in your Rotofoil, a Hovercraft-like vehicle; attempt to gain control of the ball and shoot it through your opponent's goal. Dual play screens, three-dimensional graphics, and moving goals add to the excitement and realism of this strategy/arcade game. (Apple, Atari 800/XL/XE, C 64/128)

★ When playing against the computer, try to get its Rotofoil directly behind you. If you can reach the far end of the field in this position, the computer will keep pushing you from behind, the ball will be pushed past the goals, and you will get a point. This point-scoring tactic is best employed: 1) when the goal posts are close together and distance shots are difficult and 2) when playing the toughest droids, who are normally excellent on defense.

★ When a game begins, the goal is at the player's left. If you get the ball, you should head to the left side of the playfield. If you get there quickly, you might be able to estimate where the goal is and get a three-point shot. —DAVID LANGENDOEN

RESCUE ON FRACTALUS! Epyx. Rescue pilots who were shot down over the planet Fractalus. To do this, you must navigate your Valkyrie fighter through three-dimensional mountainous terrain, shoot enemy gun installations, and, when you can, land and pick up a pilot. (Apple, Atari 800/XL/XE, C 64/128, Tandy CoCo)

★ If an alien pilot leaps up in front of your view screen, you can still kill him before he gets you. Note the color of the pilot's helmet as he rushes you; green will most likely indicate an alien. Quickly turn on your systems and fry him before he breaks your screen. —DAVID LANGENDOEN

GETTYSBURG: THE TURNING

POINT. SSI. Win this famous battle. Simulation of the one of the most important battles in American history. (64K Apple, Atari, C 64/128, IBM PC/PCjr)

★ The Union cavalry units that begin the game on the Seminary and MacPherson Ridges are among the best troops in the game. If you want to be really daring and slow down the Rebs more than they bargained for, try using them to attack the advance units facing you across the stream. Your incredible firepower and mobility can buy you one or two hours, which the Confederates might otherwise use to outflank you.

★ The proper use of artillery is one of the keys to winning the game. Use it sparingly to save on loss of effectiveness and ammunition. Also, restrict your fire at ranges over two hexes to enemy artillery positions. To further save your operation and fatigue points, mount your guns on high ground, as this will avert having to move them as often as you would if they were on ground level.

—JAMES DELSON

STRATEGIC CONQUEST. PBI Software. Conquer a vast, uncharted world before your computer opponent can. Using bombers, fighters, battleships, troopships, submarines, and a mass of armies, you explore the planet and colonize it, expanding your empire as you keep the enemy at bay. (512K Macintosh)

★ Instead of starting the game by building an army or two, order a bomber. This takes a long time to build, but once you have it you can use it to explore all the surrounding territory, locating the nearest cities. As soon as the bomber has found a city, send some armies to it. Though you may feel this is a slower way of getting started, it's actually the most efficient way of scouting nearby terrain and getting into a high-production mode right away.

★ Regardless of how safe you think you are, the enemy will try to launch sneak attacks against you. Therefore, use a screen of fighter planes to patrol your coastal waters. This will alert you to enemy invasion plans. Be sure, however, that when you establish your air patrols, the planes

have enough fuel to get out to their turnabout points and fly back to refuel. —JAMES DELSON

NEW CONVERSIONS

Ace of Aces (Accolade). Now available for Atari 400/800/XL/XE and IBM PC/PCjr. Already out for C 64/128. Reviewed in March 1987 issue.

Amnesia (Electronic Arts). Now available for C 64/128. Already out for Apple and IBM PC. Reviewed in March 1987 issue.

The Bard's Tale (Electronic Arts). Now available for Atari ST and IBM PC/PCjr. Already out for Amiga, Apple, Apple IIGs, Atari 800/XL/XE, and C 64/128. Reviewed in April 1986 issue and *Software Review* 1987.


Hardball! (Accolade). Now available for Amiga and Apple IIGs. Already out for Apple, Atari 800/XL/XE, C 64/128, and Macintosh. Reviewed in May 1986 issue and *Software Review* 1987.

Karateka (Broderbund). Scheduled for Atari ST. Already out for Apple, Atari 400/800/XL/XE, C 64/128, and IBM PC/PCjr. Reviewed in April 1985 issue.

Mean 18 (Accolade). Now available for Apple IIGs. Already out for Amiga, Atari ST, IBM PC/PCjr. Reviewed in October 1986 issue and *Software Review* 1987.

Ogre (Origin Systems). Now available for Macintosh. Already out for Amiga, Apple, Apple IIGs, Atari 800/XL/XE, Atari ST, C 64/128, and IBM PC/PCjr. Reviewed in June 1987 issue.

Shanghai (Activision). Now available for Apple IIGs. Already out for Amiga, Apple, Atari ST, C 64/128, IBM PC/PCjr, and Macintosh. Reviewed in February 1987 issue.

Tass Times in Tonetown (Activision). Now available for Apple IIGs. Already out for Amiga, Apple, Atari ST, C 64/128, IBM PC/PCjr, and Macintosh. Reviewed in February 1987 issue. 

EDITOR'S NOTE: Titles listed for the IBM PC/PCjr will also run on many IBM compatibles. Owing to the proliferation of compatibles, check with the publisher of the program or your dealer for compatibility.

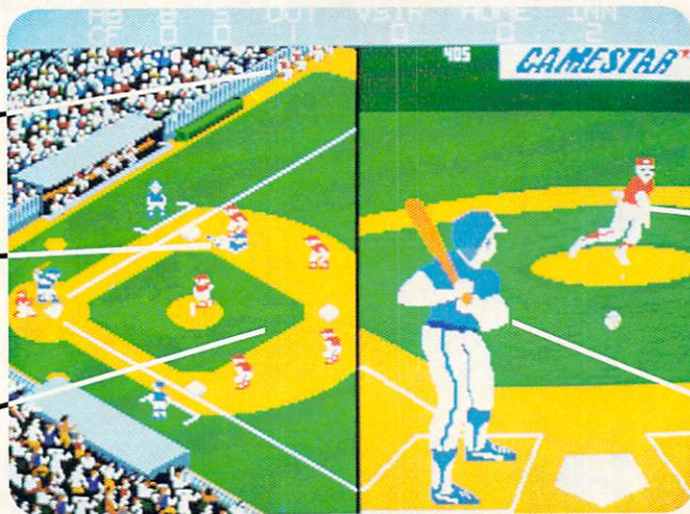
You Told Us What The Best Computer Baseball Game Would Have

"Great graphics"

"Relief pitchers—and subs"

"I like to slide—even head first."

"Let me see what's happening on the whole field."



"I want to play in the series!"

"I want to be able to throw a lot of different pitches."

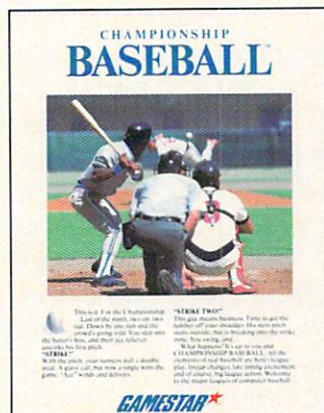
"Put me right at the plate when I'm batting."

Here It Is. *CHAMPIONSHIP BASEBALL™*

With 4 Divisions, 24 Teams, Playoffs and a Championship Series

You've been asking for the best in computer baseball games, and you want it *all*—graphics *and* features. We've heard you, and **Gamestar's** *Championship Baseball* delivers. No other product gives you the complete sport of baseball like *Championship Baseball*:

- Player Draft, complete with reserves.
- Setting your starting lineup.
- Batting Practice, Exhibition Game and League Play options.
- Each division is tougher than the last, so there's always a new challenge.

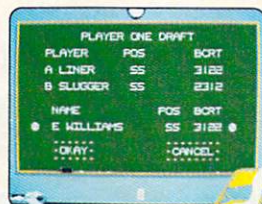


- You control all the action on the field—pitching (8 different pitches), hitting, catching, outfield relays, base running, even sliding under tags.
- Player substitutions can be made throughout the game.
- Division, playoff and championship series play.

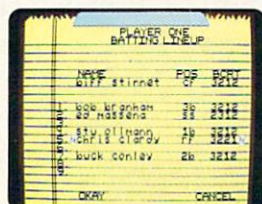
All this and much more in the most complete baseball program available. When you're ready to step into the major leagues of computer baseball, *Championship Baseball's* your ticket. Nobody else gives you more.

For IBM PC, Tandy 1000, Apple IIe, IIc, Commodore 64/128, Amiga, Atari ST and 100% compatible computers.

To order, visit your local retailer or call 1-800-227-6900



Select your players from the talent pool, based on their characteristics and skill ratings. Name them after today's stars, or anyone you want.



Determine the batting order that will have the best chance against your opponent.



Batting window disappears when the ball's in play, so you can see continuous action.

GAMESTAR★

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CIRCLE READER SERVICE 1

Soviet division arrives in Tripoli

IRAN IGNORES RUSSIAN ULTIMATUM

Soviet General Secretary Orders
Troops To Aid Iraqi Government

Assassins
Peru linked

Panama inks friendship accord in Moscow

What do you do now, Mr. President?

You already know the stories behind the headlines. But top-secret briefings don't make things any easier.

In Mindscape's *Balance of Power*, you are the President of the United States. And the experience is so real you may wonder why you don't have Secret Service protection.

Balance of Power utilizes a huge data base and advanced artificial intelligence techniques to create what *The New York Times* has called, "one of the most sophisticated strategic simulations in America, other than Pentagon war games."

Tension always escalates in this global geopolitical simulation of the cold war's cruel reality. Knowing when to back down is as important as knowing when to go to the brink.

As you manage overt and covert actions, insurrection and political deceptions, divisions of troops and diplomatic efforts, the nation's

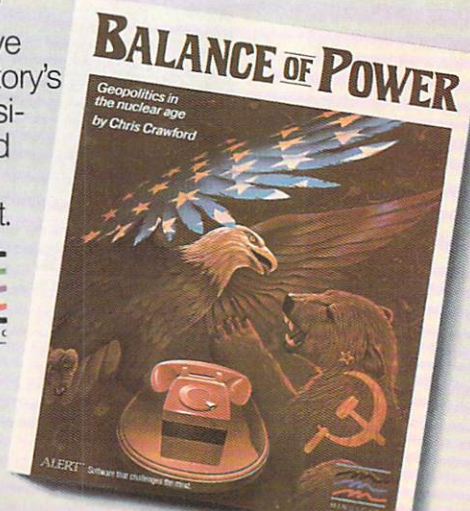
prestige will rise or fall. You have an eight-year term in which to win. But you can lose it all, for everyone, in a blinding flash with a foolish move.

Now Apple® II owners can experience the gamesmanship of brinkmanship that's already challenged Macintosh™ and IBM® PC owners. New pull-down menus on Apple and Microsoft Windows™ on IBM make *Balance of Power* leader-friendly in an otherwise hostile world.

Inaugurate a new level of challenging software into your library. Secure what Ezra Shapiro of *Byte* called, "one of the finest programs—of any type—that I've seen on a microcomputer."

When you've experienced history's first desktop presidency, you'll read the daily papers in a different light.

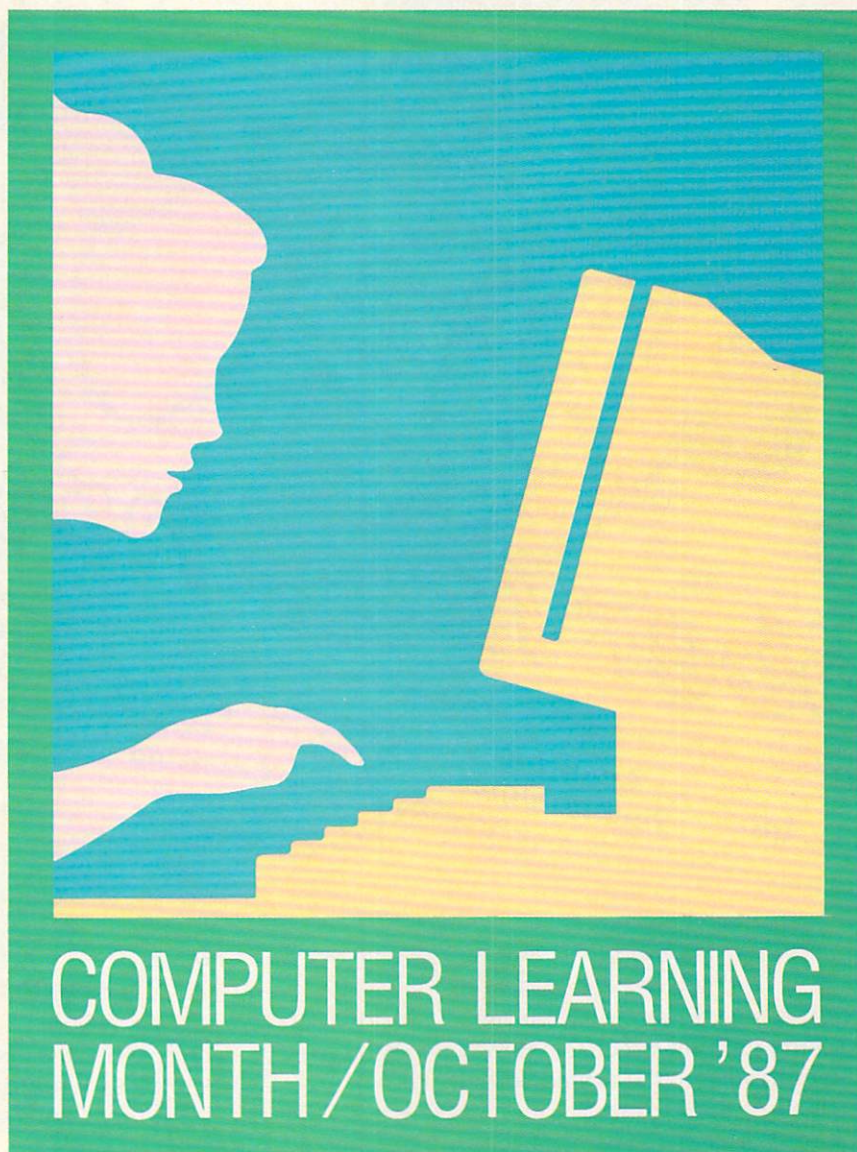
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Software that challenges the mind.



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Celebrate



Computers are the most powerful learning tools ever invented. They can take complex concepts like speed and direction and make them easily understood by simulating their properties on an electronic screen. Their word processing capabilities can free children from the burdensome, physical task of writing and encourage kids to concentrate on the creative and organizational aspects of writing. Computers can take the tiresome rotteness and strict uniformity out of education and allow children to learn and explore independently.

Computers are truly an invention to be celebrated! That's why the U.S. Congress

has declared October 1987 as Computer Learning Month. This is the perfect time for parents and educators alike to acknowledge the great strides in education that computers have helped us make. It's also the perfect time for parents, teachers, and children to experiment—to *grow* and *learn* even more—with the help of computers.

Computer Learning Month is sponsored by major educational software and computer companies, and supported by national educational organizations and state departments of education. Many of these groups plan to conduct special contests and ceremonies. They welcome

your participation! Many also are offering free educational materials such as a parents' guide, a computer wall chart, and lesson plans for teachers. For more information on these celebrations and materials, check page 29 of this section, or contact Computer Learning Month, P.O. Box 19763, Washington, D.C. 20036-0763; (202) 452-1600.

In the meantime, if you are looking for a way to begin your own personal celebration, let the following pages be your guide. They're chock-full of computer activities, contests, and software recommendations that will start you off and running!



October is Computer

Education Systems
Corporation

Mindscape, Inc.

Learning
Technologies

The Learning
Company

inCider

Join the celebration!

Across the nation, schools, teachers, students and parents are celebrating computers and education all through the month of October. Check with your school, and join in the fun! You'll discover special events, prizes, and opportunities to experience first hand the excitement of computer learning.

A Congressional Resolution.

Computer Learning Month has even gained the support of our nation's leaders. The U.S. Senate quickly declared October 1987 as Computer Learning Month. By the time you read this, we expect the House of Representatives to have passed a similar resolution.

Computer Learning Month Contest! Fun to enter. Easy to win.

You don't even have to have a computer! Write an essay (750 words or less). Create an original work of art. Also special project entries for teachers and groups of all kinds.

For official contest entry materials, mail the coupon.

Over \$100,000 in prizes.

When you win, your school wins, too!

FIRST PRIZES for each category will be computer workstations, complete with printers — one for the winner and one for the winner's school. Thirty computer workstations in all.

SECOND PRIZES for each category are multiple program software packages — one for the winner and one for the winner's school. Thirty multiple program software packages in all.

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FUN AND LEARNING
FOR EVERYONE

PARENT
NIGHTS

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Computer
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DLM, Inc.

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15 ways to enter:

	grades K-5	grades 6-9	grades 10-12
Art contest (computer generated)	■ ■	■ ■	■ ■
Art contest (non-computer generated)	■ ■	■ ■	■ ■
Essay contest	■ ■	■ ■	■ ■
Teacher (lesson ideas)	■ ■	■ ■	■ ■
Group contest	■ ■	■ ■	■ ■

■ = individual prizes ■ = school prizes

For official contest rules, art and essay ideas and suggested topics, mail in the coupon below no later than September 15, 1987. Contest entries must be postmarked no later than October 20, 1987.

FREE for parents:

Special booklet, "What every parent should know about educational computing." Packed with information on computer learning, ways you can help, ideas and resources. Free—from participating software retailers in your area.

FREE for teachers:

Special Computer Learning Month posters bound into October issues of *Classroom Computer Learning*, *Electronic Learning*, *Teaching & Computers* and *Today's Catholic Teacher*. Posters are ideal for classroom use, and they're filled with lesson plans and activities on the back. Even if you're not using computers in your classroom

now, Computer Learning Month is for you!

For additional ideas and official contest entry materials, mail the coupon.

BIG savings. Special events.

Fairs and parents' nights during October.

Look for special discount prices on educational software at participating retailers, special events and computer fairs. If your school has a computer lab, parents' nights offer a good opportunity to try computer learning first hand, and local retailers

are likely to be on hand for demonstrations. Or sponsor a computer walk-a-thon to raise money for computers and software for your school.



Computers and Education:
Giving America's Youth
the Winning Edge

*Send this today!

Yes—send me more information on Computer Learning Month and official contest entry materials.

I am a ☐ teacher ☐ parent ☐ student

I own a computer ☐ yes _____ ☐ no
(type of computer)

Name _____

School _____

Address _____

City _____

State _____

Zip _____

Phone _____

Mail coupon to: Computer Learning Month

P.O. Box 19763
Washington, D.C. 20036-0763

Springboard
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SOFTWARE GAMES

that Teach

When it comes to these action-packed programs, the name of the game is learning!

Games aren't just for fun. They're for learning, too! Especially when the games are software games like *Where in the U.S.A. Is Carmen Sandiego?* and *Grammar Gremlins*. Besides providing the standard game features of competition, mystery and intrigue, fast-paced interaction, and humor, many software games supply important lessons in curriculum areas such as U.S. geography, grammar, and mathematical theory. They make the words "fun" and "learning" synonymous.

Computer Learning Month is the perfect time to introduce children to software games that teach. The following guide provides program summaries and suggested ways to introduce *Where in the World is Carmen Sandiego?* and *Grammar Gremlins* to children. But don't stop with these two programs. There are a lot of other good, educational software games on the market, just waiting to be played!

WHERE IN THE U.S.A. IS CARMEN SANDIEGO?

COMPUTER: Apple II series, Commodore 64/128, IBM PC/PCjr
TOPICS: Social studies and problem solving
GRADE LEVEL: 5 and up
PRICE: \$44.95
PUBLISHER: Broderbund Software

Program Summary: This program is a detective game that requires (and develops) research skills, analytical thinking, and knowledge of U.S. geography to capture members of a crime organization known as V.I.L.E. The letters V.I.L.E. stand for Villains' International League of Evil. The organization is headed by Carmen Sandiego.

The program presents players with

randomly designed cases (thousands of different ones are possible) in which a prized possession, such as the Liberty Bell, has been stolen by one of 16 V.I.L.E. members. Players must investigate various clues and follow leads from U.S. city to U.S. city until they identify and catch the V.I.L.E. member who committed the crime.

The search for the criminal starts at the scene of the crime. Players begin by investigating key places in the immediate area such as the tourist information center or the local sports arena. As they collect clues and travel around the country to



Is the criminal in Virginia? Players of "Carmen Sandiego" investigate.

investigate leads, players take notes and look up pertinent information in available resources.

The program's documentation includes three important crime-solving resources: a map of the United States, a *Fodor's USA* travel guide, and a scrapbook that contains brief descriptions of each of the V.I.L.E. members.

The program has 10 levels of difficulty, or detective ranks. As players solve cases, they move upward through the ranks to reach the ultimate status of Master Detective.

Introductory Activities: To be a good detective in *Carmen*, one must be a good note taker. Before a child plays this program he or she should have had at least one experience with note-taking. For a child who has not had such an experience, try this activity: Select a detective show to watch on TV. As the child watches the show, have him or her jot down all the important clues the detective uses to solve the mystery. Review the notes together after the show.

To play *Carmen*, children must also be comfortable with using maps. To help a child increase his or her facility with maps, have the child draw a map of a route taken daily—perhaps the route to and from school. Later, have the child follow the map step-by-step. Did it lead to the correct destination? If not, what went wrong? Was a turn or street left out of the map?

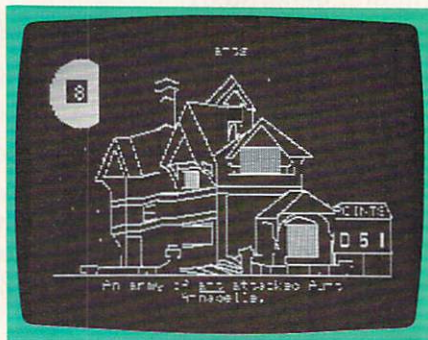
GRAMMAR GREMLINS

COMPUTER: Apple II series, IBM PC/PCjr
TOPICS: Grammar
GRADE LEVEL: 3-6
PRICE: \$49.95
PUBLISHER: Davidson & Associates

Program Summary: *Grammar Gremlins* is actually a four-part program on grammatical skills. One of these four parts is a fast-action game. In the "Grammar Gremlins Game," a haunted house appears on the screen. A spooky, full moon hangs in the sky. At the bottom of the screen is a fill-in-the-blank sentence or a question on grammar. When a pair of mysterious eyes appears in one of the windows of the house, the player presses the return key and a possible answer to the problem flies out of the window to the top of the screen. By pressing the appropriate keys, the player indicates if the answer is correct or incorrect. If the player indicates that the answer is incorrect, the eyes will appear in another window and the player waits for another possible answer. Sometimes creatures fly out of a window. If the Gremlin flies out, the player earns bonus points.

The moon in the top left corner of the screen shows the points a player may earn for each question. The points slowly tick away. The quicker a player is able to select an appropriate answer, the higher his or her score will be.

There are four possible levels of play



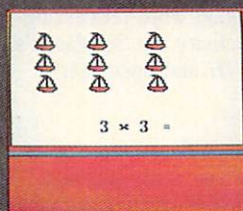
Grammar Gremlins haunt this house.

for this game. The first (lowest) is designed for the average third grader; the last level, for the average sixth grader.

Introductory Activities: You can rev children up for the fast-paced grammar challenges in this software game by running through a few grammar drills. For starters, provide a paragraph that has several grammatical errors in it. Give a child a red pencil and five minutes to find and correct the errors.

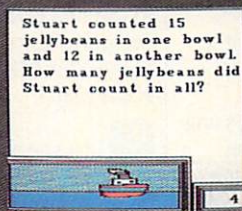
A good way to review parts of speech is to write spelling words on separate index cards and tell a child to sort the words in piles, according to speech.

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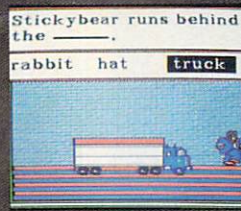
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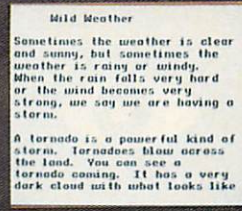
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A/M597

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TAKE THESE COMPUTER

Challenges!

10 Learning Projects for Children

Language arts. Math. Social studies. Science. These are four school subjects that "go better" with computers. That's because the computer has many unique capabilities that provide for better learning. The computer's word processing capabilities, for example, help children produce neater, more organized writing assignments. Computerized data bases make it easier for children to store and retrieve their science or social studies research. Electronic spreadsheet programs free kids from time-consuming, rote computation and encourage them to experiment with number theory and problem solving techniques.

Following are 10 learning projects that teach basic subjects by making good use of the computer's unique capabilities. Invite children to try these computer challenges!

1 Go to the library and read about reptiles. Use a data-base software program like *Friendly Filer* (published by Grolier) or *pfs:file* (Software Publishing) to create a "Creepy Creatures" data file that stores amazing scientific facts about your favorite reptiles.

2 Interview 10 different families who use computers. How does each family use computers? How much time does each family spend per day on the computer? Which family member uses the computer the most? Tally the results of your survey and use a graphics software program such as *Print Shop* (Broderbund) to make a mathematical chart or graph of your findings.

3 With the help of puzzle-making software like *Crossword Magic* (Mindscape) or *Super Wordfind* (Hartley), create a crossword or word-search puzzle that is made up of your current spelling words.

4 Use an electronic spreadsheet such as *EduCalc* (Grolier) to project the profits

of a cake sale. Your spreadsheet template might be organized like this:

A	B
1 BAKING EXPENSES	
2 CAKE PRICE	
3 ESTIMATED SALES	
4 INCOME	
5 PROFIT	

5 Boot up any word processing software and create a *story chain*. To begin the story chain, one person writes a single sentence. A second person then adds a second sentence that relates to the first one. Participants add to the chain until the story resolves itself. (The unique contribution that a word processing program makes to a story chain is that it lets writers add their sentences anywhere in the story! Two good word processing programs for this activity are Scholastic's *Bank Street Writer III* and Spinnaker's *KidWriter*.)

6 Imagine you are a fly on the wall of your bedroom. Use any Logo language program or a drawing program like *Delta Drawing* (Spinnaker) to draw a detailed map of what you see.

7 You don't need a fancy science laboratory to perform exciting lab experiments. Boot up one of the many laboratory simulation programs available and get to work! Dissect a frog with *Operation Frog* (Scholastic), or solve as many as 50 chemistry experiments with *Chem Lab* (Simon & Schuster).

8 Use a data-base program to set up data files on historical, geographic, and trivial facts about each of our 50 states. Fields for each state file could include: name of state, capital, population, terrain, location, nickname, state flower, and postal abbreviation.

9 Use word processing software to write an eight- to 10-line story. Then use the MOVE function of your word processing software to scramble the order of the sentences. Challenge a friend to unscramble the story. (Note: Younger children can scramble and unscramble the words in one sentence instead of scrambling and unscrambling several sentences in a story.)

10 Set aside one day as Family Appreciation Day. Use a graphics software program like *Certificate Maker* (published by Springboard), *Print Shop* (Broderbund), or *Principal's Assistant* (Mindscape) to create a unique award certificate for each family member. For example, Mother might deserve the "Most Understanding" award; while sister Sue might be worthy of a "Great Athlete" certificate.

MORE WAYS TO *Observe* COMPUTER LEARNING MONTH

FREE MATERIALS

A Computer Learning Month poster is available to teachers across the country. One side of the poster colorfully illustrates how computers help children learn. The flip side provides lesson plan ideas for teaching with computers.

Also available is a booklet entitled "What Every Parent Needs to Know About Educational Computing." Teachers who do not use computers in their classrooms as well as all parents of computer-using children will find this booklet helpful. It discusses the educational benefits of computers as well as how computers can be used most efficiently with children.

To receive either of these free publications, contact Computer Learning Month, P.O. Box 19763, Washington, D.C. 20036-0763; 202/223-4338.

CONTESTS

Five contests are being sponsored in honor of Computer Learning Month. Four are for students in grades K through 12; one is for teachers. Computer hardware and software will be awarded to the more than 50 winners. Titles of the contests are: Student Art (Computer Generated), Student Art (Noncomputer Generated), Student Essay, Teacher Lesson Plan Idea, and Group Project. The deadline for each contest is October 22. To receive guidelines for specific contests, contact Computer Learning Month, P.O. Box 19763, Washington, D.C. 20036-0763; 202/223-4338.

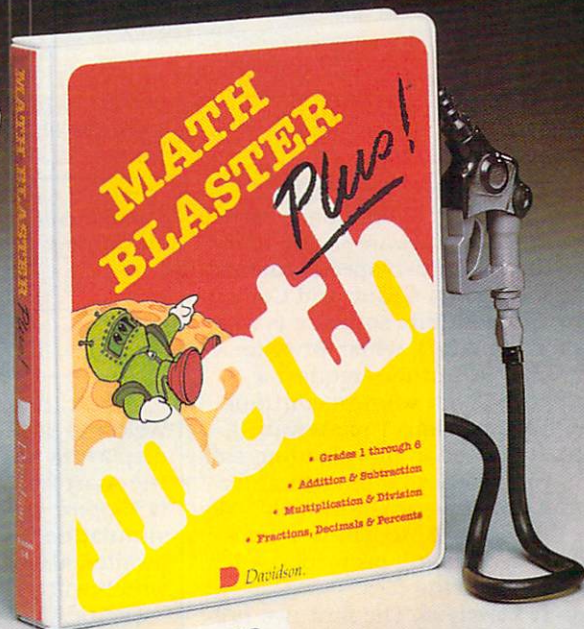
PUBLISHERS' TELEPHONE NUMBERS

Below are telephone numbers for the publishers mentioned in this section.

Broderbund Software 415/492-3200
Davidson & Associates 800/556-6141
Grolier Publishing 800/858-8858
Hartley Courseware 517/646-6458
Mindscape, Inc. 800/221-9884
Scholastic, Inc. 800/325-6149
Simon & Schuster 800/223-2336
Software Publishing Corp. 415-494-6768
Spinnaker Software 617/494-1225
Springboard Software 800/328-1223
Sunburst Communications 800/431-1934

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CIRCLE READER SERVICE 9



Davidson.

MACHINE SPECIFICS

NEWS, OPINIONS, QUOTES, AND RUMORS ABOUT YOUR FAVORITE COMPUTER

APPLE

BY CHARLES H. GAJEWAY

My recent forays on-line have turned up some good software in the libraries of the Macintosh special interest groups (SIGs) on GENie and CompuServe. Some of this software is free ("public domain"), while for other programs the authors request a modest fee if you want to continue using the programs ("shareware").

To get started in downloading software, you will need a modem and a communications program with XModem capability. XModem is a common error-checking protocol used when transferring files.

How to Download. The first two programs you should download are *Red Ryder 9.4* and *PackIt III*. Both programs are shareware and well worth the modest fees (\$40 for *Red Ryder* and \$15 for *PackIt*) requested by their authors. They'll most likely be in a SIG's library under a name such as *RYDER9.4.PIT* (or *RR94.BIN*) or *PACKIT-3.PIT*.

SIG libraries contain pictures, music, utilities, games, desk accessories, and full-scale applications.

In order to save downloading time and effort, files can be grouped together and compressed or "packed." They generally carry the file extension .PIT. In order to make such a file usable after downloading, it first must be "unpacked" with *PackIt III*.

Mac Nuggets. Software I have downloaded and liked includes *Disk Info* (DISKINS.BIN on CompuServe), a desk accessory that allows you to find, rename, and delete files inside any application; *Palencia* (PALENCIA.BIN on CompuServe), a marvelous letter-quality font for the ImageWriter; and *Quest for T-Rex*, an engrossing game created with Silicon Beach's amazing *World Builder* adventure-game construction program. Note that this program requires more than 700K and takes considerable time to download. *J-Clock* is a file that places a clock in the menu bar, and *MacsBug* is a file that darkens the

screen to prevent burn-in after a few minutes of inactivity. And that's just for starters!

CHARLES H. GAJEWAY can be reached on CompuServe (ID: 73357.3577) or on GENie (ID: C GAJEWAY).

ATARI

BY JOHN J. ANDERSON

Welcome back, EA! Electronic Arts is displaying a renewed commitment to the Atari line. Huzzah! Coming soon is *Empire*, a super-Risk style war simulation, as well as the very long-awaited *Music Construction Set*, which will support MIDI devices.

Digital Vision, makers of the superlative \$250 ComputerEyes color video digitizer for the ST, is readying a monochrome-only subset of its system ([617] 329-5400; \$150). Train a video camera on an object, and it will "read" that object into the computer. The digitizer works in gray scales even on the ST color monitor and sports the same excellent quality as its predecessor.

XE Game System. Atari was flying high at the Consumer Electronics Show in Chicago in June, complete with a booth topped by a full-size Piper Cherokee airplane. The idea was to celebrate the arrival of *Flight Simulator II* (subLOGIC), a 128K bank-select cartridge game for the new 8-bit XE Game System. The XE Game System is a revamped Atari XE with 64K, detached keyboard, light gun, and the game *Missile Command* built-in. It will ship bundled with *Flight Simulator II* and *Bug Hunt*, a shooting game that uses the new light gun. An XE game cartridge can hold up to 256K, Atari claims. A mouse is available as an option.

Mega Alert. Despite rumors to the contrary, we have it from the very highest authority that the first Mega STs are off the production line and shipping now. If this is in fact true, these souped-up STs (with two or four megabytes of memory and de-

tached keyboards) should be available when you read this.

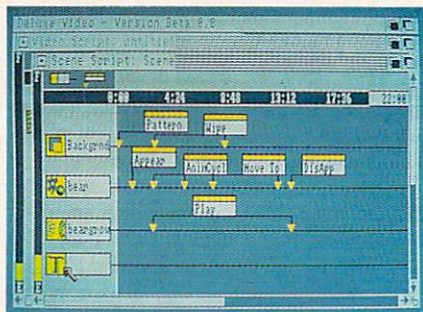
JOHN J. ANDERSON can be reached on CompuServe (ID: 76703.645).

COMMODORE

BY SHAY ADDAMS

So far the one application that truly distinguishes the Amiga from other Motorola 68000 machines (Macintoshes and Atari STs) is the desktop video production made possible by *Deluxe Video* (\$130), which lets you plug a VCR into your Amiga. Electronic Arts just released version 1.2, and probably the only thing you can't do with it is watch one channel while taping another.

The new program has a faster frame rate for smoother animation



Deluxe Video 1.2 (Electronic Arts) for Amiga allows "broadcast quality recording."

and scrolling and an interface feature for "broadcast-quality recording." If you have a megabyte of memory, an Overscan option lets you get rid of those thin borders and create full-screen videos for truly professional results.

Along with a raft of other new features, you get a disk containing 17 scene generators, lots of new sound effects, music, custom title screens, and other add-ons. The new version costs \$130, but registered owners can get an update for \$37. I'll have more to say on this new version as soon as I can figure out how to set my VCR.

Just to prove that it's still the pre-

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CIRCLE READER SERVICE 45

MACHINE SPECIFICS

mier Amiga developer, EA also added two new titles to its *Deluxe* library shelf: *Art Parts Volume Two*, with 125 images in 12 categories that range from astronomy to farming; and *Seasons & Holidays*, which provides brushes and patterns as well as clip art. These can be used with *Deluxe Video*, *Paint*, and *Print*.

Animated Education. A good-looking educational title for the C 64/128 caught my untrained eye this month. *Talking Teacher* (Firebird Licensees; [201] 444-5700; \$39.95) employs animation and voice synthesis to instruct children ages two to eight in basic vocabulary and spatial relationships (see "Software Reviews" in this issue).

SHAY ADDAMS, editor and publisher of *Questbusters*, an adventure-game newsletter, can be reached on CompuServe (ID: 72267.601) or on QuantumLink (ID: JBCALMER).

IBM

BY HENRY BEECHHOLD

A reader wanted to know what could be done about the loss of a modem carrier when a call-waiting signal hits the phone line. This is an easy, one: Dial "1170" before you dial the answering modem. If this newly instituted feature is operational in your calling area (check with your telephone company), you should hear a double beep on the line immediately after entering the code. When you've finished your modem call, the line will automatically return to call-waiting status. Thanks to Alfred Glossbrenner, "Mr. On-Line," for this hint. By the way, I highly recommend his *The Complete Handbook of Personal Computer Communications* (St. Martin's Press; \$14.95).

If the above method doesn't work for you, you have no choice but to find a modem that is not susceptible to call-waiting signals. The AT&T Modem 4000 is one.

PCjr Resources. Even though the PCjr came and went quickly, this machine is out there and in need of attention. If you're in need of news and information, your first move should be to join the PCjr Club (P.O. Box 59067, Schaumburg, IL 60159-0067; \$18 per year), which publishes a monthly newsletter that acts as a PCjr network and provides answers

to most questions on PCjr care and feeding.

Following is a list of companies that support the PCjr with parts, services, and information. (Note that adding memory and a second disk drive to your jr will enable you to run much of the same software that the IBM PC and various clones run.)

Legacy Technologies Ltd., Lincoln, NE ([800] 228-7257), add-ons, including memory and disk drives; MaxTech Computer Products, Tulsa, OK ([918] 437-2600), special cables; National PC Service and Repair, Rome, GA ([404] 295-4600), parts and service; Racore Computer Products, Inc., Los Gatos, CA ([408] 374-8290), add-ons, including memory and disk drives; Solid Rock Electronics, Arlington, TX ([817] 467-7878), add-ons, including internal memory and disk drives; PC Enterprises, Belmar, NJ ([201] 280-0025 in NJ, [800] 922-PCJR), add-ons, including memory and disk drives, internal and external.

HENRY BEECHHOLD is the author of *The Brady Guide to Microcomputer Troubleshooting & Maintenance* (Brady Books, Prentice Hall Press, New York).

MS-DOS

BY STEVE MORGENSTERN

A call from a client who wanted me to handle both the writing and the production of a newsletter turned me from a passive observer of the desktop-publishing scene into a man with a credit card and a job to do. I started out with a Leading Edge Model D with an accelerator board installed and looked first at laser printers.

The Laser Printer Question. The best price I could find on an Apple LaserWriter Plus, which is every Mac user's dream machine and can be connected with moderate levels of hassle to an MS-DOS computer, was about \$4,300. The latest model Hewlett Packard LaserJet Series II printer, beloved by many MS-DOS users, could be purchased for \$1,800. Why should an MS-DOS-oriented laser printer be so much cheaper than the Mac-compatible LaserWriter? My first guess was print quality. I was wrong.

To my surprise, in side-by-side comparisons, the HP LaserJet Series II produced better-looking printouts

than the Apple LaserWriter. The biggest difference was the quality of solid black images. Even though both printers offer identical print resolution (300 dots per inch), to my eye the HP LaserJet covered better and gave a sharper output.

But there are other differences between the two machines. The Apple LaserWriter has a 1.5MB memory, compared to the LaserJet's 512K (memory can be added), which means it can store more graphics information at one time. And the LaserWriter, which Apple used to call its most sophisticated computer, comes with 11 fonts. The LaserJet requires new and expensive (\$150-\$330 each) font cartridges. So, on these counts, the LaserWriter has a tremendous advantage.

PostScript. The LaserWriter is equipped with PostScript, a language that describes letters and shapes as a series of movements. You want to make a "T"? Fine—move left, turn at an angle, turn again, and so on, until you've drawn the outline of the letter. Then go back and fill in the outlined letter shape.

The LaserJet, on the other hand, doesn't use a set of movements to draw a "T". It has a pre-established dot pattern in memory. You want to make a "T" on a LaserJet? Fine. Drawn from memory is a dot description of the letter. Put 30 or 40 dots here, another 15 there, a couple over on the left . . .

The functional difference comes when you want to change sizes. The LaserWriter, using PostScript, needs only a single description of a letter to make it any size. The angles and movements needed to draw the letter are the same—it's only the distance traveled that changes.

On the other hand, the kind of dot-by-dot description of a letter used in a LaserJet can't just be multiplied to make the letter bigger—you would get jagged edges and unacceptable print quality. Instead, you need separate descriptions (on font cartridges) of each letter size you want to use. It's inconvenient compared to a PostScript system, which lets you expand or shrink letters at will to fit available spaces in a layout.

So I bought . . . a Hewlett Packard LaserJet Series II. The print quality is superb. I'm not using that many different type styles or sizes in the newsletter I'm producing. Besides, I

MACHINE SPECIFICS

don't yet have sufficient reason to opt for the Apple alternative.

STEVE MORGENSTERN can be reached on CompuServe (ID: 72545.606).

TANDY

BY STEPHEN MILLER

James A. Holdun of Bend, Oregon, wrote for help concerning a problem he was having running BASIC through the task-switching option in *DeskMate II*. It allows you to switch between *DeskMate* and another program by using the ALT key and the equal (=) sign. When I reviewed the SX several months ago, I liked this feature. I ran several different software packages and everything worked fine.

I didn't, however, run BASIC. Mr. Holdun did and discovered a weird phenomenon. Upon switching from BASIC back to *DeskMate II*, he found that the digital clock was speeded up. I checked it, and the same thing happened to me. I called the tech support people at Tandy and asked if they knew anything about this problem. They didn't, but checked it and called back quickly. "There seems to be a problem," they admitted and said they were looking for a solution. In the meantime, exit *DeskMate II* (the F12 key) and run BASIC from DOS.

PLAYING Music. On the other hand, Tandy alerted me to a problem, one that the FAMILY COMPUTING technical staff had also noticed. On the Tandy MS-DOS machines you can use the PLAY command in BASIC programs to create background music. However, if more than 15 or 31 notes are played, depending on the type of music, the system will lock up. Tandy offers the following patches to fix the problem:

For the SX running DOS 3.20: Copy PATCH.COM from the Supplemental Disk onto the MS-DOS/BASIC disk. Then, at the A> prompt, apply the following patches:

PATCH BASIC.EXE, 6E0F, 75F1, 9090
PATCH BASIC.EXE, 7ED5, 26C7, EB05

For the EX running DOS 2.11, apply the following patches at the A> prompt:

PATCH BASIC.EXE, 68F2, 75F1, 9090
PATCH BASIC.EXE, 6B00, 26C7, EB05

SX Memory Upgrade. The 384K that comes standard with the SX seemed more than adequate until I bought a

program that needed 512K just to load. Back I went for the 256K Parity Memory Kit (Cat No. 25-3062; \$99.95), which is alleged to be user-installable.

I've made no secret that I'm all thumbs, so the thought of adding chips was a task I approached with some trepidation. I do have a chip inserter, but it turned out to be the wrong size, so I had to do it by hand.

Let me say that it can be done. Even with the comedy of errors I went through (bent pins to straighten, missed holes, pricked index finger), I have no doubts that most of you can do it with no problem.

But here are a few things to be aware of before you begin. Don't forget to remove the tiny plastic jumper from pins E1 and E2 on the motherboard. If you don't, you get a message on-screen saying MEMORY FAILURE. Don't panic; nothing on the computer will be damaged. It's just that removing the jumper tells the computer that extra memory has been installed.

PARK the Hard Disk Drive! The location of the motherboard (where you insert the new chips) is, for me, too close to the front panel and too close to the floppy-disk drives. It doesn't give you a lot of room to maneuver. I found that I had to remove my Hard-card (internal hard-disk drive) because I had it in the slot next to the chips, and it cut down even more on the work area. If you have a Hard-card installed, make sure you run the WDPARK program before you attempt to take it out! You can destroy valuable data or even damage the disk itself if you don't.

Anyway, I love having the extra memory because several of my current programs run faster than before. But, I'm sad to report that the program for which I purchased the extra memory in the first place turned out to be a lemon.

STEPHEN MILLER is a computer consultant and journalist.

ORPHANS

BY PATRICK SPERA

Guess what? There's a new computer that's not an IBM compatible! It's the Geneve 9640, which was first announced two years ago. The Geneve is TI-99/4A compatible in hardware and software, but that's

where the similarity ends.

Speedy, Colorful Geneve. The Geneve uses the TMS9995 CPU, which is three times faster than the TMS9900 CPU used in the 99/4A, and has a speed approaching that of the Atari 1040ST. It uses the same sound chip and the same instruction sets as the original TI chip. What has been added is a real-time clock, 640K RAM (expandable to 2MB!), 80-column display, mouse interface, 512 colors (256 can be displayed at once), and composite or analog RGB video connections.

The actual computer is a board that's plugged into the TI Peripheral Expansion Box. It comes with an IBM-style keyboard, so you can remove your 99/4A unless you prefer using the cartridge port. The Geneve uses the same disk drives and controllers as the 99/4A, so all your old disks can be used. It also comes with several pieces of software, including *Advanced BASIC*, *4.21 PASCAL*, *MYWORD* (with 80-column display), *Myarc DOS*, and a cartridge saver. The total package costs \$530.

To really take advantage of all the Geneve's video modes, you'll want to use an analog RGB monitor, the same kind of high-resolution monitor used by the Amiga, Apple IIGS, and Atari ST.

There is Geneve support available on CompuServe's TIFORUM and Delphi's T.I.I.N. For more information, contact *Call Myarc*, a newsletter published by the manufacturer (P.O. Box 140, Basking Ridge, NJ 07920-1014; CompuServe ID: 73125.521).

2068 Paint. David Franson (3534A E. Squire Ave., Cudahy, WI 53110) has released an interesting utility for the TS 2068. *Extended Paint* (\$19.95) is not just another drawing program, though you can use one of its functions to draw. The idea of *EP* is to use the TS 2068's extended color mode to add high-resolution color to existing black and white pictures. And it really does the job!

There is more to *EP* than just pretty screens. *EP* can dump a gray-scaled COPY to a TS 2040 printer or an Epson printer if you have an Aerco printer interface. Color screen dumps can be made to Cannon PJ-1080A ink-jet printers. You can also use the hi-res mode in your own BASIC programs.

PATRICK SPERA is sysop of the Computer Club Forum on CompuServe (GO CLUB), a meeting place for orphaned computer users.

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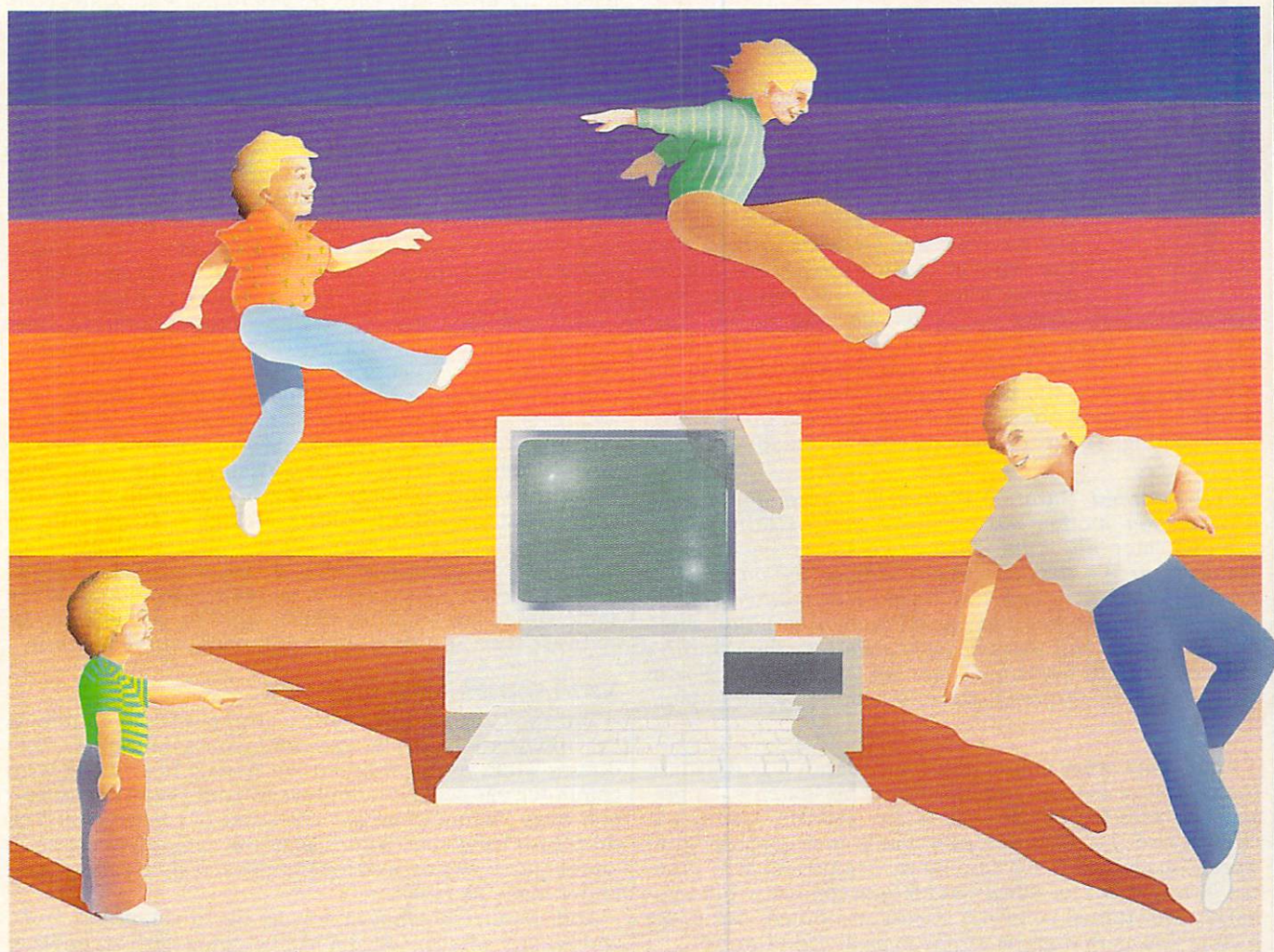
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CIRCLE READER SERVICE 4

PARENTS' GUIDE TO

LEARNING AT HOME

WITH COMPUTERS



BY BERNADETTE GREY

If you took all the computers in the schools today and divided them up equally, each student would get an average of 15 minutes a day at the keyboard," said David Moursund, founder and CEO of the International Council for Computers in Education. "That 15 minutes needs to be an hour or more."

With so little time and so few machines in schools—and with the traditional curriculum still in place—there's plenty of work for the family computer to accomplish. Unfortunately, there are no established guidelines to follow. In the office, use of the computer is pretty standard, and it's easy to understand how to bring that same work home. But parents and children using computers at home for learning are still pioneers moving into new territory.

In this extensive guide for parents on how children can use computers for learning, these are some of the questions we address: What are the most appropriate educational uses of computers? How can I get involved? How do I judge good software? Is programming an important skill to have for the future? Can I use the same computer for business that my child uses for learning? What are the best uses of computers for toddlers? For children in elementary school? For adolescents? And for high schoolers?



PRESCHOOLERS AND THEIR 'PUTERS

The most common question that parents of preschoolers ask us is, "At what age should my children start computing?"—just as they wonder at what age their kids should start walking, driving, or dating. When it comes to exploring with computers, the earlier the better, as long as you don't push them. While you shouldn't force the family's computer on a 2-, 3-, or 4-year-old, you shouldn't prevent the meeting either. If you pay attention to your preschooler's actions, you may notice that he or she will initiate that first meeting. The introduction could go like this one did:

Two-year-old Sarah scrutinized the computer from afar as her mother sat at the keyboard tallying the family's monthly bills. After a few moments, Sarah traipsed up to a disk box that had been left on the floor and grabbed a handful of disks. Her mother quickly seized them from her and moved the box to a high shelf. Sarah pouted. But tears turned to smiles when Sarah's mother pulled her onto her lap. Delighted, Sarah reached over to the keyboard and began to pound away.

Like many other children her age, Sarah was drawn to the computer without prodding from her parents. "A preschooler sees big people—his or her parents—using machines, and the child naturally wants to mimic the adult world," explained Geoff Zawolkow, vice president of product development for Advanced Ideas, a company that publishes educational software. "Using computers can make a child feel as though he or she is part of that world."

RUN: THE NEW R

Indeed, toddlers will soon become part of the computer-using society. And the earlier that they integrate computers into their lives as educational and entertainment tools, the easier it will be to adjust to computers outside of the home. Many of us old dogs had to paddle furiously to get on top of the technological wave that swept over American society faster than we could blink. Even young college graduates resisted learning new tricks when companies replaced typewriters and multifunction calculators with computers. Unlike the rest of us, young toddlers of the eighties who are born into computing homes can look upon computers as fixtures of daily life. And they won't be afraid to take control of the new technology.

"Most young children love the feeling of independence they get when they direct the computer," Christine Cataldo wrote in a November 1985 article on preschoolers for FAMILY COMPUTING. Cataldo was a professor of early childhood education at the Early Childhood Center at the State University of Buffalo in New York and directed a two-year project that studied computer-using preschoolers. "One form of control a computer gives is the power to repeat (to a point no adult could tolerate) something that fascinates the child. Computer feedback is another feature kids respond to. But while sound, color, and animated responses are all important, children only appreciate them if they are meaningful parts of a program."

With your ongoing participation and supervision, you can turn your children's fascination with computers into a learning adventure. With the appropriate software, computers are patient and amusing teachers that can give preschoolers a jump on basic-skills instruction. Software designed for preschoolers often homes in on one or more of these skills: prereading and math; recognition of shapes, opposites, and patterns; and problem solving. Programs that cover some of these areas include *Early Games for Young Children*, published by Springboard; the *Stickybear* series from Weekly Reader Family Software; *First Shapes*, distributed by Electronic Arts; *Dinosaurs*, from Advanced Ideas; and *Mr. & Mrs. Potato Head*, published by Random House Software. Using these kinds of programs, children like Derek Wilson, of Beaver, Oklahoma, and Bard Mulvey, of Chula Vista, California, have learned how to read and write—prior to any formalized education.

The best software for preschoolers invites, amuses, and responds with the use of color, simple music, and familiar pictures. Correct answers are rewarded with a punchy song, a smiling face, or even a flash of color, but wrong answers don't result in penalties or embarrassment. Programs that are too difficult for a child to manipulate on his or her own are a turn-off; the most enjoyable ones make use of just a few keys or use a keypad, joystick, touch tablet, or touch pen to simplify interaction. At the same time, the child should be able to go back to the software time and time again and not get bored with it.

EXPLORING NEW WORLDS

But the true beauty of early learning with computers is the intellectual growth and willingness to explore that occurs while young children are having fun. "Long-term computer use seems to improve learning behavior in several ways," wrote Cataldo. "The sense of competence children gain from successful use of the computer results in an increased willingness to take risks, test new ideas, and better focus on tasks."

And if your preschooler warms up to computers now, who knows what he or she will be doing with technology within the next couple of years? A few exceptional children, like Richard Foreman of Winnipeg, Manitoba, Canada, will enter elementary school with computing skills—including a knowledge of BASIC—that astonish teachers. Brenda Foreman, whose family won grand prize in FAMILY COMPUTING's annual Computing Family of the Year Contest (see page 53), explained how her son learned to program. "Richard wanted to do what his two brothers were doing and constantly asked 'How?' " she said. "In order to use BASIC, he learned the alphabet, taught himself to read, and at 3½ years of age, already an accurate, albeit slow typist, he took a pencil and printed his first word . . . RUN. Today, at 6 years of age, he is the best programmer of the three and constantly amazes us with the complexity of his programs."

OFF TO ELEMENTARY SCHOOL—AND HOME TO COMPUTERS



Once children begin their formal education, coming face to face with computers is inevitable. Each school year, the computer becomes more entrenched in the classroom. There were an average of 11 computers per public elementary school

as of 1986, according to Talmis, a market-research firm, up from just six in 1984. From the time computers were declared educational tools, basic-skills instruction software, namely drill-and-practice and tutorial-style programs have dominated the educational market. While these programs can be effective learning tools, many have shortcomings. Tutorials are often very dry and mimic what a teacher can do best. And because of its nature, some drill-and-practice programs assume that students understand the subject at hand.

So then, as a parent, your mission is to help your kids choose and use the right software. "Parents need to realize that their children don't always know what to do; they know what they like to do," said Ann Dana, a microcomputer consultant in Hinsdale, Illinois. "Parents should be supportive and encouraging. Help your children get started, spend time, and be available for questions. It's important to have the time to be there."

LEARNING IS FUN AND GAMES

Software that disguises learning—and won't be abandoned for television—will win over your children. Programs that come to mind are The Learning Company's *Writer Rabbit*, a grammar program that brings children along on the adventures of a rabbit, *Math Blaster II* (Davidson & Associates), a space-age inspired package that teaches addition, subtraction, multiplication, and division, and Scholastic's *Microzine* series, a magazine-like potpourri of fun-learning programs in such areas as creative writing, math, history, and problem solving. Children are also excited by "computery" features such as synthesized speech and voice recognition, which can be used as effective learning tools.

"For elementary-school children, the software bought for home use must be inherently more motivational, more inviting than those programs used in the schools," said Anne Wujcik, program director at Talmis. "It's different at school where the teacher says 'O.K., you're going to the computer lab now,' or 'It's your turn at the computer.' There is a formal structure at school that doesn't exist in the home. But if the educational software at home is not motivational, the child will turn to games."

NO SUBJECT AT HAND

And, of course, for a program to benefit your child educationally, it needn't work at teaching a specific skill; many valuable programs can help your child improve his

or her overall problem-solving skills through analysis, evaluation, and trial and error. The home is the perfect place for this kind of learning because there are few time constraints, and your child is free to fiddle around with software that doesn't necessarily tie in to a particular curriculum.

Take, for instance, two geography programs published by Broderbund Software, *Where in the World Is Carmen Sandiego?* and its successor, *Where in the U.S.A. Is Carmen Sandiego?* While playing a detective who is tracking

YOURS, MINE, & OURS: SHARING YOUR COMPUTER WITH YOUR KIDS

Your computer workstation *was* set up just the way you like it. Until your kids invaded. Now the only 1-2-3 you can ever find is a counting program and your word processor talks back. At your last sales presentation, your boss was most impressed by the revenues of your 8-year-old's lemonade stand.

You promised the kids that they could use the computer in your home office, and you've never gone back on your word. Yet, if a second computer is not in your budget, you and your kids will have to co-exist in the same computer space. Here's how to share one computer—and still talk at the dinner table.

- Give your children personal space of their own. Let them pin up posters, pictures, calendars, and reminders on the wall or on a bulletin board. And give them a desk drawer and a portion of the desktop so they have a place for their own belongings.

- To keep unwanted hands off of your disks, give the kids a separate disk box and their own blank disks. If you lose files—and you don't have a backup—you'll have no one but yourself to blame.

- Set up time schedules for using the computer. After school may be an optimal time for your children and after dinner may be best for you.

- At the same time, be sensitive to deadlines. If one of your kids has a tough homework assignment due, give him or her first dibs on the computer. Then when you have a deadline, it will be easier to explain the urgency of your project.

- Your children may shy away from using what was once *your* computer. Try to help them feel more at ease by encouraging them to share "our computer" rather than borrow "my workstation."

- Your kids are probably shorter than you are. They may need an adjustable chair or even a footrest. And make sure the printer and paper are within easy reach of your children.

- Especially when children are involved, you have to think about stability when you purchase computer furniture and set up your workstation. Your equipment should be able to survive a few good shakes and shoves.

- Keep your work space especially neat. If you work best in clutter, turn a new leaf. Your organized mess will turn to chaos if you're sharing a desk with someone else. Put everything in its place, so you can find it when you need it.

- To keep confidential information confidential, you may want to lock up your disk box and filing cabinets. An industrious child may try to set up a Christmas card list in the middle of your client database. Or worse, your personal financial records could end up on a neighbor's kitchen table.

—LISA WU

down a pack of thieves, your children can have fun soaking up facts about this country and the rest of the world. Using another program, *Snooper Troops*, published by Spinnaker Software, children can develop their risk-taking, research, and note-taking skills as they play a detective solving a mystery.

Children can also use applications software for a range of subject areas. Youngsters in grades three to six can certainly experiment with word-processing, graphics, and music software, or even delve into telecommunications for some on-line exploration. (Beware of soaring phone bills.) The entire Sweeney family, Computing Family of the Year winners, use GEnie, an on-line service. "Last year, we added the modem and then GEnie and Grolier's On-Line Encyclopedia," said Judi Sweeney. "Our kids (9-year-old Joy and 11-year-old Bill) and some of the other kids in the neighborhood now use Grolier's for homework help, and we can't be more thankful for its help in avoiding those last-minute dashes to the library."

Word-processing, music, and drawing programs also help to stimulate creative abilities. You may even discover natural talents that you didn't know your children had. "It wasn't until we purchased *Dazzle Draw* (Broderbund Software) that we realized our daughter's real abilities and interests were in more artistic channels," said Sweeney. "She's the one who likes to color and graphically edit *The Print Shop* (Broderbund Software) pictures. She's the one we buy colored ribbon and paper for. And she loves to sit and listen to *Music Construction Set* (Electronic Arts)."

Even games, arguably, have qualities that are beneficial to children; some computer games can help kids develop their problem-solving and research skills. More important, when played in groups, they encourage cooperation with other players, including parents, siblings, and peers. "I must admit that text games have increased my 11-year-old son Chris's reading ability, attention to detail, reasoning skills, and organization for goal accomplishment," commented Marilyn Engle, whose Computing Family of the Year entry won fourth prize. "He and his friends have spent many intriguing hours discussing game strategy, having to think things out very clearly and logically in order to win a game."

YOUNG TEENS: APPLICATIONS GROW UP



In junior high school, emphasis on computer learning tends to shift from basic-skills instruction to applications and computer literacy. Many children in this age group enroll in programming classes at school or even attend computer camps. Children between the ages of 12 and 15 are old enough to grasp the abstractness of programming.

Despite the growing importance of computers in our society, most children will never have to program. To drive a car, you don't have to understand what goes on under the hood. Likewise, to operate a computer, you don't have to know a computer language.

"It is not necessary for kids to learn about computers, especially kids under the age of 15," said Hank Becker, a research scientist at The Johns Hopkins University who is studying the effects of computers on learning. "Nevertheless, it is one of the many possible microworlds for intelligent exploring, just as one might build with blocks, learn about bugs, or draw road maps. It is one way of developing abstract, critical learning."

BUSINESS VERSUS PLEASURE

For adolescents, cheerful music and graphics become less important motivational influences than the program's usefulness. Attitudes toward computers are based more on their perceptions of what computers can do for them. "Once children reach the junior high school level,

COMPUTER LEARNING MONTH

October is the official month for enthusiastic parents to turn their kids on to the cutting edge of educational computing. Thirty-four sponsors from the corporate and educational sectors and a U.S. senator and a congressman are turning the gears to commemorate October as Computer Learning Month.

The message is that computers can tap the potential of kids of all ages and abilities to develop their individual talents. You can encourage your kids and their teachers to submit entries to nationwide contests. The judges will be looking at essays, computer art, and creative group projects. There will even be a time capsule to preserve student works from our time for the year 2001.

OTHER HAPPENINGS

- Parents' Back-to-School-Computing Night. Schools can decide to host an informational forum at which parents will learn about computer technology and participate with teachers in discussions to keep them abreast of computerized curriculum.

- Computer dealers nationwide will hold Computer Learning Month fairs and promotional events.

- Computer Learning Month newsletters, posters, and parent booklets will be available for schools, museums, libraries, and families.

GET INVOLVED IN COMPUTER LEARNING MONTH

- Contact your children's schools to let them know about Computer Learning Month.

- Find out about PTA computer liaison groups; if your school doesn't have such a group, maybe you can start one.

- Ask PTA representatives to report on computer activities at monthly meetings.

- Organize a fundraiser to buy computer hardware and software.

- Suggest that computers become an important item on the school's budget.

- Find out if your school can make discounted hardware and software available for student's home use. Offer to set up a "home-school computer store."

For more information, contact: Computer Learning Month, P.O. Box 19763, Washington, DC 20036-0763.

— LISA WU

they make their own decisions about whether or not they will use the computer," said Wujcik. "The highly motivated student uses the computer to get ahead."

As parents, you can influence your young teen's attitude by being a role model and using the computer to increase your own productivity. In addition, find software for your children that deals with practical, relevant topics. Simulations, for instance, mimic real life and, at the same time, can help children develop their logic and problem-solving skills. *ChemLab*, published by Simon & Schuster, *The Halley Project* (Mindscape), which simulates a solar system exploration, and *Operation Frog* (Scholastic Software), a simulation of a frog dissection, are three programs that encourage exploration of the sciences and, as home accompaniments, expand school learning.

A LIFETIME OF WRITING

Probably the single most important application for children in this age group is word processing. They start to write a lot more school reports, and word processors can help them improve writing skills—and make writing easier and more enjoyable. The addition of spelling checkers, outliners, style checkers, and on-line thesauruses can point out errors and further improve writing in a diplomatic and noninsulting manner.

While some word processors may be too complicated and cumbersome for the average 13- or 14-year-old, others—such as *Bank Street Writer* (Broderbund Software)—are aimed at children. Commands are simple to learn, and programs utilize on-screen help menus and easy-to-follow manuals. But word processors require one skill that many young teenagers, particularly boys, don't have: typing. "I recommend that parents get their kids in a school keyboarding class as early as they can," said Moursund.

Even better for children with computers at home are the software packages that teach typing skills, such as *Typing Well* (Mindscape), *Success With Typing* (Scholastic Software), and *Typing Tutor III* (Simon & Schuster). These programs are so simple and such fun to use that even 10-year-olds have learned to touch-type. "We used a typing program that was a boon for all of us," said Veronica Mulvey, of Chula Vista, California. "While some students may not have a typing class until junior high, Gino, our 11-year-old, had the chance to develop these skills in the fifth grade. It has given him a head start on skills that he can benefit from for a lifetime."

HIGH SCHOOLERS GET AHEAD



Skills such as touch-typing are most likely to be tried once children reach high school. These days, it's not surprising to hear about students using computers for business courses, creative writing, or even music theory.

Of course, the more things change, the more they stay the same: The vast majority of computers can still be found in computer rooms. As we've mentioned earlier, children who may be considering a computer-related career should enroll in at least one programming course. Most high schoolers, however, will never directly benefit from knowing the difference between REM and DIM.

But school views on the best uses for computers for young adults are changing. Since the arrival of computers into their schools, the percentage of high school teachers who say the best use of computers is to learn about computers has dropped from 75 percent to 60 percent, according to a survey completed by Becker. And the percentage who think its best use is as an applications tool has doubled to 30 percent.

THE EASY WAY OUT

How can 15-, 16-, 17-, and 18-year-olds best use computers as applications tools? Face it. Most high school students want the best grades possible with the least effort. High schoolers know about the importance of productivity; their life-styles demand it. Besides busy class schedules and homework, they have grueling after-school schedules: part-time jobs, sports practices, club meetings, music lessons, play rehearsals. You name it, they've signed up for it.

Word processors, databases, spreadsheets, and desktop-publishing packages are all means to the same end: getting homework done as efficiently as possible. Using a word-processing program, students find it easier to write term papers and, with a spreadsheet, they can plot results of chemistry experiments. And more and more teenagers are using desktop-publishing packages to prepare projects for classes and to put together school newspapers and club newsletters. These types of programs are becoming the staples of many software libraries since they can be shared by all family members.

"My 16-year-old daughter, Becky, is in the gifted and talented program in high school," said Pat Wrigley of Vallejo, California, a fifth-place winner in our Computing Family of the Year contest. "The number of college-quality term papers and research projects she whips out on the computer is mind boggling. She uses *Word Juggler* (Quark), as I do, for basic word processing, and she got *Term Paper Writer* (Activision) for Christmas and enjoys the ease of dealing with footnotes and bibliographies. She is three chapters into her first novel and looks forward to a career in writing."

There are also programs that are geared toward busy and motivated high school students. Davidson & Associates has come out with a software and accessories package called *Homeworker* that incorporates a calendar, a grade keeper, a word processor, an outliner, and a flash-card maker. Savtek Corp. publishes *A-Plus ETG*, a word processing and graphics package for students that integrates text and drawings. And *Homework Helper: Writing*, from Spinnaker Software, is an interactive word processor for high schoolers that asks questions to get ideas flowing.

MOTIVATION FROM WITHIN

Programs like those mentioned above are more appropriate for older children, who are able to look at long-term rewards, such as boosting a grade point average and getting accepted to better colleges. The chance of raising a mediocre SAT score by 100 or so points is enough of a motivation to convince a teenager to use an SAT program. You might also suggest software that can help tutor your teenager in a problem area—often subjects that are mind

boggling and boring unless taught with great care. For instance, *Geometry* (Sensei Software/Broderbund), teaches its subject in a way that a teacher or a tutor never could: by taking advantage of the capabilities of a Macintosh to animate a blackboard with parallelograms, circles, and triangles.

Software publishers have also been releasing some business simulations that are appropriate for high school kids. For instance, with *Managing for Success* (Blue Chip Software), your kids can be the CEOs of million-dollar manufacturing operations. Programs such as these blur the boundaries between education, business, and entertainment because students are learning about business and finances and basic business concepts as they become involved in a type of game with a mission.

The most dramatic gains that computers have made in education have been with the special needs of the learning and physically disabled. Many parents have told tales of how computers have altered the lives of children with such physical handicaps as cerebral palsy, blindness, and hearing disorders. They also talk about how software packages, whether they be word processors or drill-and-practice programs, have helped frustrated learning-disabled children love school. (See *Home-School Connection* articles in February 1987 and April 1987 issues.)

No matter what age your children are or what disabilities they may have, your computer can be an effective educational influence in your home. "What computers can do successfully depends on the child's own natural preferences and the home influence," said Becker. "Parents influence the routes of exploring at home. The best

way is neither to push, nor to leave the child alone, expecting things to happen, nor to use the computer exclusively as an adult hobby. The best way is to be enthusiastic and inclusive toward the child. The parents should be involved in something they enjoy computers for—and involve the child as well."

The key is to think of the computer not as a magic wand but as a tool. If you take a pragmatic approach to learning at home instead of an idealistic one, your entire family is far more likely to meet with success. **FC**

PUBLISHERS' PHONE NUMBERS

Activision (415) 960-0410
 Advanced Ideas (415) 526-9100
 Blue Chip Software (415) 546-1866
 Broderbund Software (415) 492-3200
 Davidson & Associates (213) 534-4070
 Electronic Arts (415) 571-7171
 First Byte/Electronic Arts (415) 571-7171
 The Learning Company (415) 328-5410
 Mindscape (312) 480-7667
 Quark Inc. (303) 934-2211
 Random House Software (212) 751-2600
 Savtek Corporation (617) 891-0638
 Scholastic Software (212) 505-3000
 Simon and Schuster Software (201) 767-5937
 Spinnaker Software (617) 494-1200
 Springboard Software (612) 944-3915
 Weekly Reader Family Software (203) 638-2571

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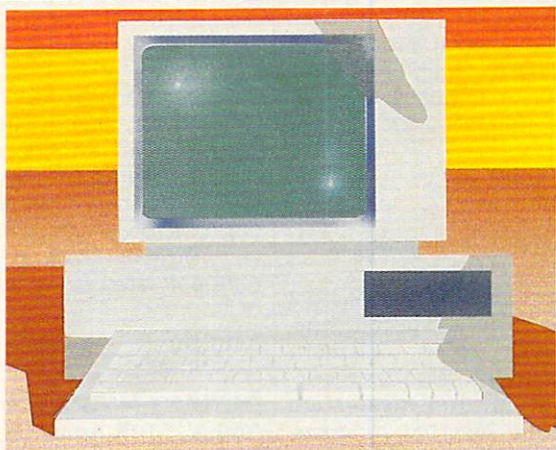
What's the mark of good educational software? While there are different ways to grade some packages—such as music and graphic software—there are certain traits that many educational programs have in common. We've put together a report card to help you separate the good from

the mediocre from the bad. In the left column, we've listed the characteristics of good educational software. To evaluate a program, you can rate its performance in each of these categories.

CHARACTERISTIC	PERFORMANCE			
	Excellent	Good	Satisfactory	Unsatisfactory
Easy to use.				
Makes learning fun.				
Allows for exploration.				
Has progressive levels of difficulty.				
Suits the tastes of different children.				
Appropriate to child's manual dexterity.				
Encourages problem solving.				
Gives the child creative power.				
Rewards but doesn't penalize.				
Teaches a concept rather than a set of facts.				
Manual is clear and complete.				
Graphics are visually appealing.				
Sound effects are entertaining.				
Doesn't require additional hardware.				
Overall performance.				
Value for money.				

Reported by associate editor Bernadette Grey and editorial coordinator Lisa Wu.

CRITICS' CHOICE AWARDS



EDUCATION AND CREATIVITY FOR CHILDREN AND ADULTS

Over the course of a year, FAMILY COMPUTING's reviewers and their families boot up, test, and use scores of software packages. When you see as much software as they do, it takes a lot to make you say, "Wow!" The following programs all wowed them: Each garnered four stars—our highest rating—in overall performance during the past 12 issues of FAMILY COMPUTING.

EARLY YEARS

FIRST SHAPES. First Byte/Electronic Arts, (415) 571-7171. 512K Amiga, Apple IIcs, Atari ST, 512K Macintosh. \$50. Reviewed May 1987.

Teaches shape recognition to toddlers with a skillful mix of colorful graphics and speech synthesis. Stars Ted E. Bear, an ursine character who plays five different learning activities with children, including a Make-A-Match memory game similar to the "Concentration" TV show. "Our family highly recommends this program . . . and predicts that Ted E. Bear will be a favorite companion for years to come."

—TAN A. SUMMERS

KIDSTIME. Great Wave Software, (408) 438-1990. Macintosh. \$50. Reviewed January 1987.

A five-program collection featuring a story-writing module that reads everything aloud and the KidsNotes music program that uses an on-screen piano keyboard and lets you save your compositions. An excellent value "with enough variety to serve everyone . . . *KidsTime* proves the Mac can be a kid's computer, too."

—SHARON ZARDETTO AKER

FINANCIAL SIMULATIONS

MANAGING FOR SUCCESS. Blue Chip Software, (415) 546-1866. 256K IBM PC.* \$60. Reviewed February 1987. You're the boss (CEO) of a large manufacturing corporation, overseeing the activities and expenditures of seven departments. "Just as in real life, each action sets off a chain of reactions that determine [your] total corporate profile." What you come away with is an understanding of the business world's parameters.

—ROBIN RASKIN

VENTURE MAGAZINE'S BUSINESS SIMULATOR. Reality Technologies, (215) 387-6055. 256K IBM PC.* \$70. Reviewed June 1987.

Learn what M.B.A. students learn about marketing, advertising, building and running a factory, raising money in the financial markets, and more with this in-depth simulation of running a company. You can "learn more about the concepts and practices of business finances with no motivation other than the intense desire to beat the pants off Hewlett-Packard."

—STEVE MORGENSTERN

FOREIGN LANGUAGE

TICKET TO PARIS. Blue Lion Software, (617) 876-2500. 128K Apple IIe/IIc/IIcs, C 64/128, IBM PC/PCjr.* \$30-\$40. Reviewed October 1986.

What better way to practice French vocabulary than by playing a game and absorbing a little French culture at the same time! With a plot and a score card, this adventure takes you from Left Bank to Right Bank and all points in between as you try to find your eccentric cousin. "It kept our family entertained long after a textbook would have been tossed aside."

—TAN A. SUMMERS

GEOGRAPHY

WHERE IN THE U.S.A. IS CARMEN SANDIEGO? Broderbund Software, (415) 492-3200. 64K Apple, C 64/128, IBM PC/PCjr.* \$40-\$45. Reviewed March 1987.

Carmen Sandiego and her band of desperados are back, this time in the good old U.S. of A. Just like in the original *Where in the World Is Carmen Sandiego?*, players soak up lots of facts about physical, economic, and political geography as they search for the perpetrator of a particular crime.

—TONY MORRIS

GRAPHICS

CERTIFICATE MAKER. Springboard Software, (612) 944-3915. 64K Apple, Atari ST, C 64/128, 256K IBM PC,* 512K Macintosh. \$50-\$60. Reviewed December 1986.

Inaugurated a new type of graphics program—one designed just for creating certificates. Some of the awards are comic (a "Rude Awakening Award" with a gorilla about to pounce on a man in bed); some are blank. Others are for athletic, scholastic, or religious achievements. All are easy to put together, as you choose elements such as border and font from menus. Ideal for families, schools, clubs, or other organizations. —BETTY J. SUTHERLAND

LANGUAGE ARTS

A-PLUS ETG. Savtek Corporation, (617) 891-0638. 256K IBM PC.* \$90. Reviewed March 1987.

A word processor plus, tailored especially for high school and college students. Features such items as special character sets for French, German, Greek, Italian, Spanish, and mathematics and physics. The main "plus" is a cursor-driven graphics program that allows drawings—such as graphs, charts, and maps—to be inserted in documents. —TONY MORRIS

HOMEWORKER. Davidson & Associates, (213) 534-4070. 128K Apple IIe/IIc/IIgs, 256K IBM PC.* \$90. Reviewed January 1987.

For organizing and completing homework assignments, *HomeWorker* hits the mark. Made up of six modules, such as an integrated word processor and outliner, a flash-card maker, and a grade keeper. Includes all the tools the typical high schooler needs. "What it adds up to is exceptional value in a single piece of multipurpose software." —GWEN SOLOMON

JUNGLE BOOK READING. Fisher-Price/Spinnaker, (617) 494-1200. Apple, C 64/128. \$25–\$40. Reviewed September 1986.

Passages from Rudyard Kipling's delightful classic *Jungle Book*, attractive animation, and sometimes even speech synthesis enliven the reading lessons found here. "If you're in the market to spiff up your 7- to 12-year-old's reading skills, but he or she insists on games, you can't miss with this one. It delivers the best of both." —TAN A. SUMMERS

WRITER RABBIT. The Learning Company, (415) 328-5410. 64K Apple, IBM PC/PCjr.* \$50. Reviewed February 1987.

Children can't begin to party with *Writer Rabbit* until they correctly identify the nouns, verbs, and adverbs among the words and phrases in Rabbit's comical sentences. While definitely drill and practice, the lessons are so cleverly disguised by cute rewards, such as a printed certificate and colorful animation, that children will keep coming back to it. —TAN A. SUMMERS

WRITING 1-5. EduWare/Britannica, (415) 546-1866. 64K Apple, IBM PC/PCjr.* \$40 each. Reviewed September 1986.

Each of these five interrelated programs (which you can use separately or together) offers grammar lessons for ages 12 and above. Especially good for identifying the parts of your writing which need improvement. "Our whole family discovered areas in which our writing could be made better . . . succeeds admirably." —TONY MORRIS

MATHEMATICS

FISH SCALES. DLM, Inc. (214) 248-6300. Apple. \$33. Reviewed September 1986.

A fishing motif (How big is that fish?) helps children learn about measurements of height, length, and distance. Six games bring delight to a subject that's typically dry. "Kindergarten-age children . . . played quite independently after a brief introduction." —MARLENE BUMGARNER ELTGROTH

GEOMETRY. Sensei Software/Broderbund, (415) 492-3200. 512K Macintosh. \$100. Reviewed December 1986. Takes full advantage of the Macintosh's graphic capabilities by turning into an animated blackboard that demonstrates the details of geometry through tutorials and sets of problems to solve. It's "an excellent resource for a geometry student since it can be customized to match the textbook used in class." —MARLENE BUMGARNER ELTGROTH

MUSIC

INSTANT MUSIC. Electronic Arts, (415) 571-7171. 512K Amiga, 512K Apple IIgs. \$50. Reviewed April 1987.

Invites creativity, as this is music you "paint" rather than write, with notes that are represented on-screen by various colored blocks. Then, for example, if you want the sound to go up, you move the line of blocks up. Even inexperienced musicians can begin by loading one of the 40 supplied tunes and playing along by moving the mouse. —TAN A. SUMMERS

THE MUSIC STUDIO. Activision, (415) 960-0410. Amiga, Atari ST, Atari XE/XL, C 64/128. \$35–\$80. Reviewed October 1986.

By employing the now-familiar icon-based commands and pull-down menus found in many paint programs, this becomes one music studio that's not only for professionals. You compose music with either the traditional staff and notes (manipulated by a mouse or joystick) or with the built-in Music Paintbox, where by moving colored rectangles around the staff, the notes change. "I felt like music was suddenly more accessible to me than it had been before. That's computing at its best—bringing you closer to your interests." —MARLENE BUMGARNER ELTGROTH

TYPING

SUCCESS WITH TYPING. Scholastic Software, (212) 505-3000. Apple IIe/IIc/IIgs, IBM PC/PCjr.* \$50. Reviewed November 1986.

Everything you need in a touch-typing course spread over 18 lessons that offer both teaching and practice. With clear instructions and excellent graphics, "any motivated adult or older child could learn to type with this program—and find the whole experience quite pleasant." —CATHY FRANK

TYPE! Broderbund Software, (415) 492-3200. 64K Apple, C 64/128, IBM PC/PCjr.* \$40–\$50. Reviewed March 1987. All typing programs run through the fundamentals of home keys, what the left and right hands do, and how to increase speed and accuracy. What makes *Type!* stand out are the extras. For instance, "no matter what lesson you're on, *Type!* posts your average speed, accuracy percentage, goals, and problem areas." Teenagers and adults "will find it much more entertaining than standard classroom drill." —TAN A. SUMMERS

* Titles listed for the IBM PC/PCjr will also run on most IBM PC compatibles; owing to the proliferation of compatibles, check with the publisher of the program or your dealer for compatibility.

Tandy Strengthens MS-DOS Line

TWO NEW 1000-SERIES COMPUTERS GIVE THE GIANT RETAILER AN ARRAY OF PRODUCTS, PRICES, AND FEATURES

BY LANCE PAAVOLA AND NICK SULLIVAN

Fort Worth, Texas—Tandy introduced four new computers and a laser printer early last month, 10 years to the day (August 3, 1977) after the introduction of its 4K TRS-80 Model I.

That Pleistocene year—two years before *VisiCalc*, four years before the IBM PC, five years before the Commodore 64, and seven years before the Macintosh—also marked the first shipments of the 4K Apple II and the opening of the first ComputerLand stores. Happy Anniversary everyone—we hardly recognize you! But this is a fast-paced industry—let's move on.

In 1984 Tandy introduced the Tandy 1000. It was the company's first IBM-compatible computer and the foundation of what is now an extensive MS-DOS line, which includes the 1000 series and 3000 series, plus a laptop (see "Tandy Announcements" box). In 1985, the 1000 was the first name-brand MS-DOS computer to sell for less than \$1,000, and it quickly became one of the top sellers in the industry.

In 1986, when the 1000 was replaced by the 1000 EX and the 1000 SX, Tandy was in a "dead heat" with Apple as the number one seller of computers at the retail level, according to Infocorp, a California firm that tracks industry sales figures.

On top of that success, Tandy has now added the 1000 HX and the 1000 TX. Thus, Tandy offers four computers in the 1000 line, ranging in price from \$599 to \$1,199 (see chart).

3.5-INCH DRIVES

The two new 1000s both sport 3.5-inch disk drives, which are slowly but surely replacing the "traditional" 5.25-inch drives. These smaller drives spin disks that are sturdier



Tandy chairman John V. Roach, shown here with the new Tandy 1000 TX and 1000 HX computers, thinks the MS-DOS software standard opens the door to innovative hardware. See interview with Roach on page 46.

LANCE PAAVOLA IS FAMILY COMPUTING'S technical director, and NICK SULLIVAN is a senior editor.

and store twice as much as the older models.

However, if you already have a library of 5.25-inch software, you can outfit both the HX (externally) and TX (internally) with a Tandy 5.25-inch drive. Alternatively, you can buy two 3.5-inch drives or one 3.5-inch and a hard-disk drive.

Both the HX and the TX also incorporate the volume control knob and headphone jack found on the EX. The entire Tandy 1000 line has the best native sound capability of any MS-DOS computer (three-voice harmony is possible). Unfortunately, very little software takes advantage of these impressive music features and accessories.

Finally, both new computers are more colorful than the standard PC and can show 16 colors at once. Neither, however, can match the splendorous 256 colors that the new IBM Model 30 displays simultaneously.

Here's a look at the features that set these two machines apart from one another and from other comparable computers.

Preview: TANDY 1000 HX

TURN ON, TUNE IN

The 1000 HX holds "more technology per dollar than any other MS-DOS machine," a comment echoed by everyone at Tandy from chairman John Roach on down. The HX, targeted at the home, education, and "first-time user" markets, is the "first truly functional one-drive MS-DOS computer." Why is Tandy so high on its new entry-level computer?

As the MS-DOS operating system and software become more entrenched in the computer industry, continuing efforts are made to circumvent what is referred to as "the cryptic A prompt [A>]." Long-time MS-DOS users either learn to live with A>—the MS-DOS method of asking for a command—or find their own way around it. But a newcomer who turns a computer on and wants to write a letter will twiddle thumbs waiting for A> to appear and then wonder what to do when it finally pulls into the station.

Tandy has tackled these problems

in an inventive way with the 1000 HX. MS-DOS is built into the machine as part of ROM. When you turn it on, you don't have to load MS-DOS from a disk, and you don't have to wait long before the action starts. The machine boots in about three seconds and . . .

. . . up pops a menu. Instead of typing a command for the Grand Inquisitor A>, you choose from the menu. You can even use a mouse if you wish. You can run *Personal DeskMate 2*, set the system time and date, run programs on drive A, or adjust the system configuration (for different drive combinations and monitors, for example). Tandy calls this a "power-and-run" computer.

How practical is this new approach to MS-DOS? Without a chance to experiment under different conditions, it's impossible to say. Obviously, the lightning-quick load is a boon. The menu is helpful, and if you tire of it, you can remove it. And because MS-DOS is part of the machine and doesn't have to be loaded from disk, you can more easily compute with

HOW THE TANDY 1000s STACK UP AGAINST IBM'S MODEL 30

	TANDY 1000 EX	TANDY 1000 HX	TANDY 1000 SX	TANDY 1000 TX	IBM PS/2 MODEL 30
List price	\$599	\$699	\$849	\$1,199	\$1,695–\$2,295
Microprocessor	8088-2	8088-2	8088-2	80286	8086
Clock speed (MHz)	4.77 and 7.16	4.77 and 7.16	4.77 and 7.16	4 and 8	8
Norton Computing Index	1.4	1.4	1.4	7.1	1.8
Memory (RAM): included	256K	256K	384K	640K	640K
maximum	640K	640K	640K	640K + 128K for video	640K
Clock/calendar	None	\$39.95 (SmartWatch)	\$39.95 (SmartWatch)	\$39.95 (SmartWatch)	Built in
Disk drives: included	One 5.25-inch 360K	One 3.5-inch 720K	One 5.25-inch 360K	One 3.5-inch 720K	Two 720K 3.5-inch or one 720K 3.5-inch and one 20MB fixed
Disk drives: optional (from manufacturer)	External 5.25-inch 360K External 3.5-inch 720K	Internal 3.5-inch 720K External 5.25-inch 360K External 20MB fixed	Internal 5.25-inch 360K Internal 3.5-inch 720K Internal 20MB hard card, tape External 20/40MB fixed External Bernoulli box	Internal 3.5-inch 720K Internal 5.25-inch 360K Internal 20MB hard card, tape External 5.25-inch 360K External 20/40MB fixed External Bernoulli box	External 5.25-inch 360K
Keyboard	Built in; 90 keys	Built in; 90 keys	Detachable; 90 keys	Detachable; 90 keys	Detachable; 101 keys
Display support	Digital RGBI, monochrome, composite	Digital RGBI, monochrome, composite	Digital RGBI, monochrome, composite	Digital RGBI, monochrome, composite	Analog (RGB or monochrome)
Maximum resolution	640 x 200 (4 colors); 320 x 200 (16 colors)	640 x 200 (4 colors); 320 x 200 (16 colors)	640 x 200 (4 colors); 320 x 200 (16 colors)	640 x 200 (4 colors); 320 x 200 (16 colors)	640 x 480 (2 colors); 320 x 200 (256 colors)
Total colors available	16	16	16	16	Over 256,000
Sound	Three voices; headphone jack w/ volume control	Three voices; headphone jack w/ volume control	Three voices; audio jack	Three voices; headphone jack w/ volume control	One voice
Other built-in ports	Parallel, two joystick, external drive	Parallel, two joystick, external drive	Parallel, two joystick, light pen	Parallel, serial, two joystick	Serial, parallel, pointing device (e.g., mouse)
Expansion slots	One slot accepts 3 "PLUS" expansion boards	One slot accepts 3 "PLUS" expansion boards	Five 10-inch PC compatible	Five 10-inch PC compatible	Three 14-inch PC compatible
Software included	BASIC, MS-DOS 2.11, Personal DeskMate	BASIC, MS-DOS 2.11 (in ROM), Personal DeskMate 2	BASIC, DeskMate II, MS-DOS 3.2	BASIC, MS-DOS 3.2, Personal DeskMate 2	Startup disk
Weight	19 pounds	19 pounds	31 pounds	31 pounds	17 pounds
Warranty	90-day limited	90-day limited	90-day limited	90-day limited	12-month limited



The Tandy 1000 TX



The Tandy 1000 HX

only one disk drive.

But to run different application programs—or to make one load automatically when you turn on the computer—you'll still need a basic understanding of how MS-DOS operates. Another potential drawback is that MS-DOS 2.11 is in ROM; many new programs require MS-DOS 3.1 or 3.2, and future programs will eventually require 3.3. You can use these later versions of MS-DOS, but you'll have to load them the old-fashioned way and deal with A>.

So MS-DOS in ROM is inventive and potentially useful—but it doesn't turn the computer into an appliance, which is every manufacturer's goal.

The other main attribute of the HX is its compactness, which is partly a function of the 3.5-inch disk drive. Moreover, compared to the Apple IIc, Amiga 500, and Atari ST, similarly priced computers, the 1000 HX has much more expansion potential (though less than many other MS-DOS machines). It can accept up to three PLUS expansion boards, just like the 1000 EX. An external 5.25-inch drive can be added for \$250; an external 20MB hard-disk drive sells for less than \$1,000.

From this perch, the 3.5-inch disk drive and—to a lesser degree—MS-DOS in ROM make the HX a better deal than the EX.

Preview: TANDY 1000 TX

A TURBO-CHARGED PC

Does TX stand for Texas? Is it XT spelled backwards? Or does it signify a turbo-charged 1000? Whatever, this top-of-the-line 1000 will make your spreadsheets sing and other ap-

plications sizzle. Plus, it comes with the enhanced graphics, sound, and other features that made the 1000 line famous.

The heart of the TX—and the source of its speed—is Intel's 80286 microprocessor. Until recently, it was the presence of the 80286—instead of an Intel 8088 or similar chip—that made the difference between PC (or XT)-class and AT-class computers. IBM PC ATs and compatibles are true powerhouses, running at extraordinary speeds and accepting up to 16MB of memory, but they generally cost upwards of \$2,000.

So how has Tandy managed to produce an 80286 machine that sells for only \$1,199? They've put the AT chip into a standard PC body, producing a tremendous boost in speed, yet not yielding a true AT compatible. It's like dropping a V-8 engine into a Volkswagen Bug: you get increased performance, but not what you'd get from the same V-8 in a Mercedes Roadster.

The TX, for instance, takes standard PC short and medium expansion cards, but not those designed specifically for the AT. It's limited to 640K of program memory. It won't run Microsoft's promised new Operating System/2. And it comes with "standard" 720K 3.5-inch disks rather than the high-density (1.44MB) variety used in the new IBM Model 50 and Model 60.

But the TX is fast. Tandy uses the Norton Computing Index (NCI)—one of many ways to compare computer performance and part of the best-selling *Norton Utilities* package—to compare its machines to each other and to IBM's. Using this scale, an IBM PC or PC XT measures in at 1.0, a Model

30 at 1.8, and a PC AT at 7.8. The TX's Computing Index (CI) is an impressive 7.1.

You'll hardly notice that speed if you use your computer only for word processing or for telecomputing. But you should see a big difference when reformatting a newsletter using a desktop-publishing program, checking the spelling in a long document, or recalculating a substantial spreadsheet. And you'll find a few applications that actually run too fast.

If you want a true AT-compatible, look at the Tandy 3000 line. But if you want a superfaster PC compatible with a 3.5-inch disk drive, the TX may be all the sports car you need.

TANDY ANNOUNCEMENTS

Tandy 1400 LT—The company that really put laptops on the map has finally brought out an MS-DOS laptop. It runs on batteries and has two 3.5-inch disk drives and a backlit LCD screen.

Tandy 4000—This new computer is built around the Intel 80386 microprocessor, one of the most advanced on the market today. The 4000 will run the upcoming Operating System/2, but it also uses many existing add-ons and monitors. The 4000 can be used as an engineering workstation, network file server, or desktop-publishing system.

LP-1000 Laser Printer—Tandy's first laser printer produces six pages per minute. Besides its own Tandy mode, the printer emulates the HP LaserJet, IBM Proprinter, and IBM Wheelwriter.

THE MAN WHO WOULD OUTSELL IBM

AN INTERVIEW
WITH
TANDY CHAIRMAN
JOHN V. ROACH

John V. Roach, 49, has held various positions—chairman, chief executive officer, and president—at Tandy Corporation since 1981. He's the company's first long-term chairman since founder Charles Tandy died in 1978. Roach advanced through the ranks at Tandy and made his name in the 1960s by installing the billing/accounting systems that the company still uses. Later, he was vice president in charge of worldwide manufacturing and became known as an advocate of the computer. Today, sitting in his cavernous high-ceilinged office on the top floor of the Tandy Center in Fort Worth, Roach can swivel and see Tandy manufacturing plants dotting the flat terrain. He has a room with a Texas view.

In the plants, workers are assembling Tandy 1000 computers, which various market-research firms tab as the best-selling computer in America today. On Roach's desk—next to an old-fashioned black phone—a Tandy 1000 runs *DeskMate*. Every so often the screen moves, because the computer is networked to Roach's assistants, who perpetually update his calendar. "That's the good part," he says. "The bad part is I never get time to go to the bathroom." On a crystal-clear summer day when you could see halfway to the Rio Grande, the calendar kindly made time for a visit from FAMILY COMPUTING.

FC: With your two new Tandy 1000 computers—and now four altogether—you've brought package-goods pricing techniques to the computer industry.

ROACH: One of the problems with the collapsing of price points is how to establish enough difference between the machines. Eighty percent of our computer products are under \$1,500.

On the 1000 HX, we've done some things that are the forerunner of future changes that will make computing friendlier. The HX will make computer technology desirable to those who didn't understand it before. The HX is also the first *practical* single-drive MS-DOS machine.

FC: Does Tandy's retail experience say

price will drive market expansion?

ROACH: Price is a factor, and ease of use is a factor. A number of new users have come into the market over the past two years; increased ease of use will continue that trend.

FC: What do you know about the breakdown between men and women buyers, and how will the HX affect that breakdown?

ROACH: I don't know anything about the breakdown. But I guarantee that women will like the HX. My wife doesn't know what 'boot' means; she doesn't want to know what 'boot' means. No one wants to know what 'boot' means. You just turn the HX on, and up pops a menu.

FC: What sets the TX apart from the other 1000s?

ROACH: The TX represents raw performance. It will put the 286 [the Intel 80286 microprocessor used in the IBM PC AT] into the home and home-business markets. The TX makes the IBM XT and the IBM Model 30 look like *Ned's First Reader*. The Model 30 was an orphan from the word go. The TX runs circles around it and costs less.

FC: Is MS-DOS the standard for the home market for the foreseeable future?

ROACH: MS-DOS is the only standard. We toyed long and hard with the question of manufacturing a Macintosh-like, 68000 machine. But we used to sell both Beta and VHS videocassette recorders, too; now we sell only VHS. With MS-DOS and OS/2 as software standards, there's an opening for great hardware innovation.

FC: What do you mean?

ROACH: Software compatibility is the real compatibility issue in the industry. Beyond that, people look for differentiating hardware features. The software doesn't care if it's running on an AT bus or a city bus—as long as it runs. We can say now—we couldn't before—that the original Tandy 1000 wasn't hardware compatible with the IBM PC.

FC: As a retailer of both computers and consumer electronics goods, such as compact disk players and VCRs, do you see these technologies merging in the future?

ROACH: Put it this way. The group that just walked out of my office was all engineers. And they weren't talking about what's happening today. The real home computer hasn't been made yet.

FC: As a hardware manufacturer, how far can you push if the software is not there?

ROACH: We're not into software *per se*, we're into making computers easy to

use. Just selling hardware in boxes without selling software is an archaic way of selling machines. Our software approach is somewhere between systems software and applications software. We want software that is maintainable, saleable, usable, installable . . .

FC: Such as *DeskMate*?

ROACH: Such as *DeskMate*. And now we're working to make the installation and maintenance of networks easy, so that small groups of people can tie their computers together. When people make a phone call, they don't care if they go through AT&T, Rolm, or MCI, whether it bounces off a satellite, whether it's analog or digital. All they want to do is talk! Our goal is to achieve the same thing with the networking of computers.

FC: What's the breakdown of Tandy computers in homes, schools, and businesses?

ROACH: Half are in homes and home businesses, and half are in businesses and institutions. We count education as a business.

FC: What's the primary use of computers at home these days?

ROACH: People have always enjoyed entertainment on computers at home. And in the office, too, for that matter. But the motivation today is for business at home.

FC: What do you use that joystick on your desk for?

ROACH: As a pointing device. You can see I don't have enough room for a mouse.

FC: Do you think mice will become more common?

ROACH: While we've been selling mice as accessories, I think they may be more important in the future. In the new version of *DeskMate* you can use a mouse; but you can also use function keys and cursor keys if you like. All the 1000 machines have built-in mouse/joystick ports, so it's an easy addition.

FC: What do you think will happen to all the 'clone' manufacturers crowding the market?

ROACH: The world of the clone is probably gone. We're not selling clones. Inside our machines you can't find anything that makes us a clone. The cloning of hardware is almost—but not quite—a thing of the past. From here on out you'll see great hardware innovation and, to a slightly lesser degree, an improving user interface.

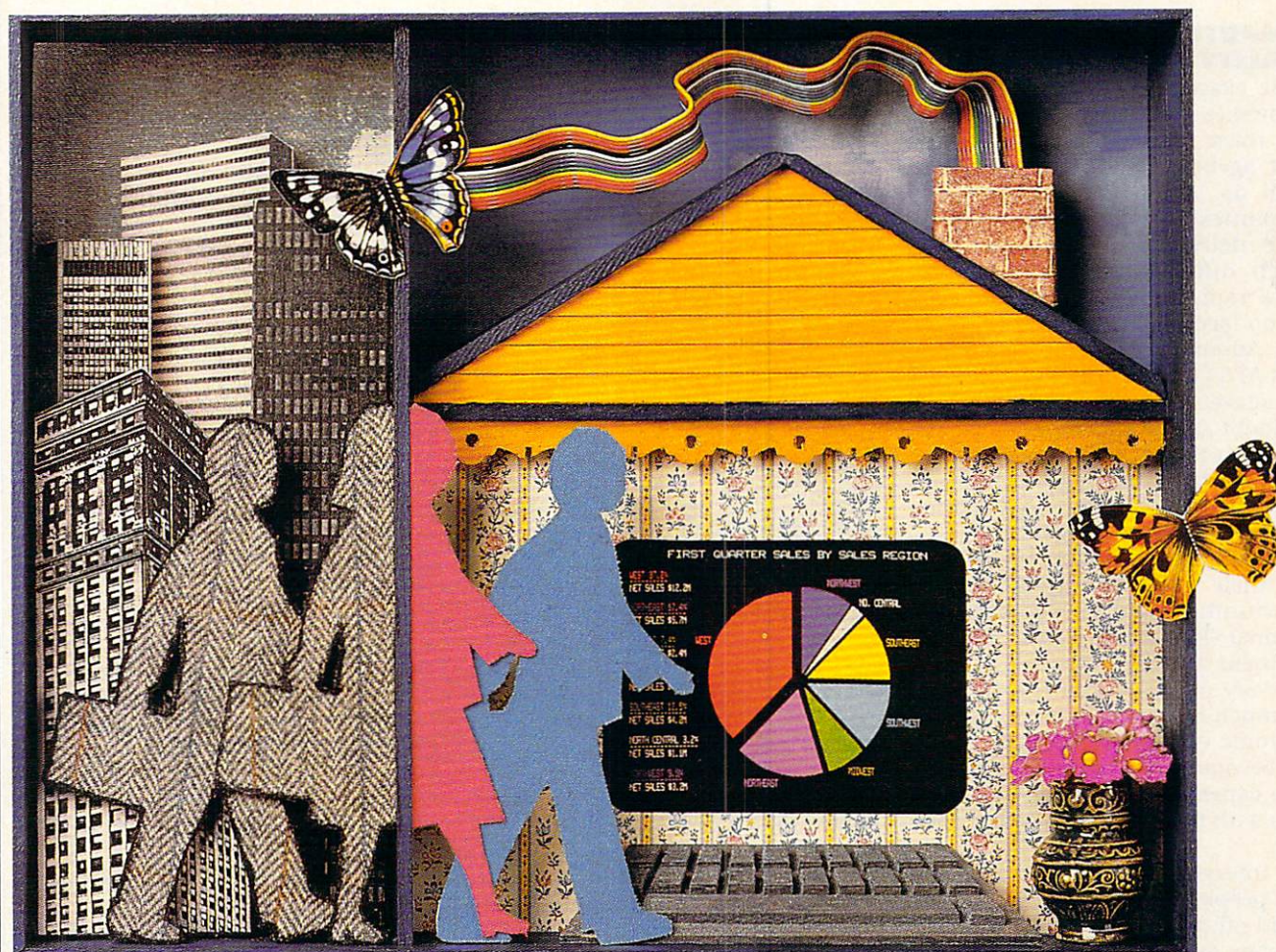
FC: Where would Tandy Corporation be today if you hadn't introduced an MS-DOS machine so early in November 1984?

ROACH: I don't think we did it early enough. ☐

Leaving the Corporate Cocoon

COMPUTERS SPUR THE TREND TOWARD WORKING AT HOME

BY NICK SULLIVAN



Because of corporate cutbacks, middle-management logjams, and a host of converging life-style and social trends, many Americans are quitting or being laid off from corporate jobs. Instead of dragging their resumes out of mothballs, many are putting their

gray flannel suits and skirts into mothballs—and setting up shop with a computer at home. Rest assured that you can go home again—especially if you have a computer.

In some depressed industries, such as oil, laid-off workers don't even bother to look for new jobs. Some large New York corporate outplacement firms say that as many as 30

percent of employees who are laid off don't want to look for work elsewhere—that's nearly three times the figure of five years ago. But even people with thriving careers in thriving industries are straying from the corporate track.

"The increase in two-income families, the notion that you can combine life-style with remunerative oc-

cupations, and the decline in the cost of technology have led to a sharp rise in the formation of small- and home-based businesses," said Bruce Phillips, a director of database development at the United States Small Business Administration in Washington, D.C.

Another important factor is the shift from a manufacturing to a service- and information-oriented economy, which doesn't need storefronts or industrial plants. Thus, an individual working from a spare bedroom can constitute a de facto company. Finally, we're living in the age of the entrepreneur, when the saga of Steve Jobs has become part of the national subconscious, when it's become easier to establish self-respect without a corporate persona.

COMPUTERS ALLOW QUALITY WORK AT HOME

The exact number of home-based businesses is the subject of great debate these days, as various government agencies, private corporations (such as telephone and computer companies), and market-research firms deliver different figures to match different definitions. Estimates range from 1.3 million to 23 million (according to the Small Business Administration) or 15 million (says AT&T).

Whatever the actual figure, there is no doubt about the impact of computers on this dramatic employment trend, perhaps the most significant since the rise of big "organization man" corporations in the 1950s.

People with computer skills find that their know-how leads to work opportunities, and people with professional skills know that computers give them the same tool used in virtually every office around the country. The much-ballyhooed (and maligned) electronic cottage of the early 1980s has become a full-fledged electronic office capable of competing on many levels with the traditional watercooler office.

In interviews around the country with people who've quit, been fired, or laid off from a full-time job with a company and then taken up work at home, it became clear that the reasons for changing employment vary radically. Some are laid off in a sagging industry and have no choice but to start something new. Others become frustrated with the lack of corporate advancement, excessive hours, or travel.

Several former corporate employees always wanted to do something on their own—had entrepreneurship "in their blood." The confluence of many

of the above-mentioned trends makes the time right now. And, not coincidentally, many of the corporate drop-outs are in their mid-30s and early 40s, a time of "mid-life" soul-searching when people look ahead and ask themselves what they want to do with the rest of their lives.

Whatever the reasons for shifting from corporate to home office, those who have converted are in almost universal agreement on three points: 1) They generally make less money than before, but are much happier (although women who leave clerical positions can easily double their incomes); 2) They couldn't have done what they're doing without a computer and the other side benefits of microprocessor technology, such as answering machines; and 3) They might not stay at home forever, but they have no intention of going back to work as a company employee again.

THE CHANGING FACES OF WORK

Here's a look at a few of the faces that are changing the way America works.

Pepper Keenan, age 45
Metairie, Louisiana



Pepper Keenan was a "land man" for Mis-tex, a Gulf Coast oil-drilling company. His job was to travel through Mississippi and Louisiana convincing property owners to let Mis-tex drill on their land and secure drilling leases. When drilling started to "peter out" in 1982, Keenan decided to get out of the business altogether. "Economic conditions were bad for all oil companies," he said. "There was no point looking elsewhere for work."

One of his best friends, Perkins Thornton, had a real-estate appraisal business, which he talked Keenan into joining. Five years later, the two of them are still independent appraisers for the government, mortgage companies, and banks that are evaluating mortgage applications.

Keenan, who is married and the father of three children, has a Tandy 1000 set up at home, and Thornton has two TRS-80 Model 4s and a Tandy 3000 in his office. Keenan works at home, at the office, and on the road. "I often work at night with a system at home," said Keenan. "I get absorbed in the computer in my own room."

Thornton and Keenan use the com-

puters (and a friend's internal Hayes modem) to search national and local on-line databases for housing and construction costs so that they keep abreast of housing values. They use specialized software to appraise single-, multiple-, and income-producing dwellings. Keenan is in the process of adding his own modem to his system, so that it will be easier to log on to a national database and get construction costs on-line.

"Financially, it's not as rewarding," said Keenan about his new station in life. "But I like it more; I've got a helluva lot more. I used to leave Monday and go on the road until Friday. I'm home more. I'm satisfied with what I am. I just need to get a little more educated about the market. And I've got to get my modem working."

Ellen Brooks, age 40
Malvern, Pennsylvania



In the late 1970s, Ellen Brooks was director of advertising for American Express (card division) in New York City. She bought advertising services from large ad agencies, such as Ogilvy & Mather. Today, she lives in Malvern, Pennsylvania, and works on her own, supplying agencies with the kinds of creative material she used to buy. Her company car? A Mercedes.

"The financial benefits of working for a corporation—if any—are minuscule. For one thing, I get much better tax benefits working at home," said Brooks, who has also managed to buy a second home in Vermont after working six years from her home. "The downside is that as a freelancer I don't have the power to make final decisions I'd have working for a corporation. The upside is that I don't get bored because the work changes from assignment to assignment."

Brooks left the fast-lane New York ad world because she "met a cute doctor [now her husband, Bill] who asked, 'How'd you like to come with me to Pennsylvania?'" She landed a job as senior product manager for National Liberty, a life and health insurance company, and was managing its direct-response campaigns. But the corporate culture was not to her liking, and she left. "Malvern is not exactly the mecca of advertising, and I didn't really want to commit myself to a job anyway. I thought I might go from the frying pan into the fire. But I did talk to agencies, and freelance

work started coming in over the transom." Most of her clients now are ad agencies that need creative services.

Brooks used to work with an electric typewriter, but when that broke down her brother convinced her to buy a computer. She bought a Morrow, which uses the CP/M operating system, and WordStar. "CP/M's not compatible with much these days, but I can transfer material to ad agencies via modem," she said. In fact, last summer when she moved her office out of her home and into spare office space with some colleagues, she had to transfer all her files to an MS-DOS system.

Will Brooks be tempted to return to corporate life again? As she says, big companies like American Express always have "something new and different happening."

"Last fall and spring I made some forays. I suppose it was mid-life crisis time and I said, 'Maybe another look,' " said Brooks, who doesn't believe she's really 40. "But my lifestyle's much improved. I don't miss the politics. And I don't have to commute."

Glenn Patterson, age 37
Annandale, Virginia



In 1972, Glenn Patterson was in data processing for the Marine Corps, working with mainframes. In 1980, he went to a bank, also working with mainframes. In 1981, he went to MCI Telecommunications as a senior technician. Again, mainframes. In 1984, he became interested in micros. Patterson set out on his own as a computer consultant, with 95 percent of his work on micros and 5 percent on mainframes. His clients now include the U.S. Department of Labor, Department of Education, and Department of Health and Human Services, in addition to Boeing Computer Services.

"The decision was not to go into business for myself; the decision was to get out of corporate," said Patterson. "Corporate goals were not compatible with mine. I was frustrated with management's lack of concern, lack of responsiveness to my sugges-

tions. By the time I left I was working excessive hours, and that was putting a strain on my family life. I had a 6-month old daughter then, and I had to rearrange my priorities."

Patterson bought a Zenith computer and joined the Independent Computer Consultants Association, which he says has been instrumental to his success, helping him with such concerns as networking, marketing, medical benefits, and taxes. "When you're on your own, you're a business, not an employee. But you don't have the background to run a business."

While pregnant with their second child, Patterson's wife, Edna, also left her job with the government to become a full-time Tupperware manager working from home. She uses a customized database to track customers and unit sales and to prepare automated reports for Tupperware.

"When you hit the lean periods, it can be rough," said Patterson, reflecting about his and his wife's independent statuses. "I may be missing the money, but then I remember how lucky I am to spend time with the baby. The joy of seeing her roll over for the first time—you can't make that up with money."

THE GOVERNMENT'S PERSPECTIVE

The following two excerpts were taken from *Measurement and Evaluation of the Population of Family-Owned and Home-based Businesses*, September 1986, a publication of the Office of Advocacy, U.S. Small Business Administration, Joanne H. Pratt and John A. Davis, authors.

The Importance of Home Business to the Economy

Home-based businesses offer several contributions to the economy which have not been well documented. First, the home serves as an incubator for many new businesses. Often business ideas which are too expensive to test in a formal business organization can be more economically evaluated when the operation is carried out from the home.

In addition, home-based businesses account for a large and growing number of the companies operating in the service sector. Because the service sector is growing so rapidly and is so fundamental to our economic health, home-based businesses become a critical component of our economy to watch. Finally, home-based businesses provide jobs to those who otherwise might be unable to work because of personal handicaps, household responsibilities, or the need to supervise children or elderly members of the household.

The Impact of Computers on Home-Business Formation

How does income-producing work get started in the home? Individuals are motivated to begin home-based work for many reasons, including the desire to spend more time with their families or because of a family history of entrepreneurship. Shifts in the economy that cause loss of employment or an involuntary transfer to part-time employment are other incentives to begin working from home.

But now there is an added incentive: Widespread adoption of the personal computer has made it technically feasible to perform many tasks relatively unlimited by place or time. As an individual gains familiarity with his or her new tool, it becomes increasingly obvious that a more flexible work and leisure life is a practical option.

Pratt's [Joanne Pratt, one of the report's authors] own theory of the category of business inception prompted by the electronic revolution suggests that an employee begins to work at home with his or her electronic briefcase, a personal computer. A little volunteer spreadsheet bookkeeping leads to moonlighting for pay. This contract work grows into an income-producing activity that launches a home-based entrepreneur . . .

Marjorie Bertrand, age 39
Flushing, New York



After 16 years at Mobil Oil, Marjorie Bertrand's job as personnel assistant in the employee relations department was "surplussed" (as she puts it) in July 1985. She had been on maternity leave in 1984 and, when she went back to work, found that her department had been reorganized. "They made it very difficult for me. They made it so difficult I had to leave."

Bertrand didn't have many options, but she did have a Commodore 64 at home, which her husband had bought to "mess around with." She saw an ad in the local shopper for a typist and found work typing inspection reports for an engineer. She's still doing this and has added more work.

A neighbor in Queens had set up a company (JIN International) to export medical equipment to China. Bertrand upgraded to an Amiga and started doing secretarial work for him, still from her home. Now the proprietor spends so much time in China, Bertrand handles his clients in the United States. One of her new tasks is to solicit American man-

ufacturers of medical equipment who want to sell their wares in China.

A year ago her husband bought a modem to cruise bulletin boards, but Bertrand really takes it for a ride. She sends Telexes back and forth to her boss in China. "The mail takes so long, and communicating by phone is so difficult and expensive, that Telex is the best method."

Meantime, Bertrand has picked up a side job transcribing a physics book from manuscript to disk for a professor she met at an Amiga users' group meeting. She's now working 20 to 30 hours a week, plus raising her two children (ages 3 and 7). Last May she started advertising in the yellow pages under the name Quick-Pro.

"What I'm making is a far cry from before, but at least I don't spend \$500 a month on child care and commuting. The bottom line is I'm probably better off. I could use a little more work though," said Bertrand.

Gil Gordon, age 38

Monmouth Junction, New Jersey



In 1982, after almost 10 years in personnel management at Johnson & Johnson and nine months short of being vested for his pension, Gil Gordon left the company. "I had done well there and liked the company, but I was managing more than doing," said Gordon, now president of Gil Gordon Associates. "Beyond that, I had always had the urge to do something on my own. Finally, I read an excerpt of Alvin Toffler's *The Third Wave* [Bantam Books] in *The New York Times* in June 1981. My interest in telecommuting was the stimulus to leave; it gave me a specific business interest.

"I remember a conference at J & J

when a man from the Labor Department said that the electronic cottage might be good for oddballs and freaks. That didn't sound right to me. I thought the concept was good, but not being executed right by companies." Now, Gordon publishes *Telecommuting Review*, a newsletter that describes current activities in the telecommuting fields.

Along with the newsletter and his telecommuting consulting, Gordon also consults in job training and personnel management for medium to large companies. His word processor is essential there for billing and writing proposals, training manuals, and project reports. One of his tasks is to make suggestions for improving employee morale and reducing turnover.

When he went out on his own, Gordon took a half-time contract from J & J to get him going. Among other things, that allowed him to continue receiving medical benefits, important because his wife was pregnant.

Initially Gordon worked from a folding chair and a card table in a spare bedroom. He first bought an Osborne and then a Zenith PC. He's since added a Mita personal copier, two phone lines, an answering machine, a NEC laptop, and a modem.

After writing his newsletter, Gordon sends it via The Source to Telespan Publishing, his California publisher. He also uses the modem to communicate with an aerospace client in California via Gordon's in-house electronic mail system.

"My father owned a hardware store, so that's more in my blood than the corporate," said Gordon. "I'm not doing as well, but I have no regrets. It's a big quality-of-life change. I get more exercise, and I have breakfast with the kids. I like the sense of uncertainty. Before, I could see my career path for the next 30 years. That's not much fun."

Jim Gregory, age 50

Morganville, New Jersey



In a previous incarnation, Jim Gregory was vice president of marketing for Select Magazines, a national newsstand distributor. When the president's position became open, Gregory admits that he had more than a passing interest in the job. However, he felt that he could perform the same functions, but be his own boss, so Gregory left the company after working there for 12 years.

"In December 1983, I bought an IBM PC and a color monitor, even though I wasn't familiar with how it worked—but I knew I needed it. On January 1, 1984, I was on my own, working at the dining room table."

Gregory continued the same line of work, advising magazines on the best way to gain newsstand distribution (everything from negotiating the distribution contract to determining where the magazine should be sold) and then following up to make sure the method was working. His first client, as it happens, was FAMILY COMPUTING magazine; other clients now include *Venture*, *Billboard*, *The New Republic*, and *The Economist*.

As his business has grown, so has his house; he added a \$25,000 addition that is now his office. "Taxwise it made more sense to depreciate an office rather than rent one, and I've increased the value of the house."

When he started out, Gregory had to teach himself how to use a word processor before he could write a letter. Now he uses Lotus 1-2-3, *Frame-work*, *MultiMate*, and *dBase III* for price analysis, mailings, and budgeting for publishers. "I wouldn't attempt this without a computer," said Gregory. He doesn't have a secretary, but his son and niece worked with him last summer. He bought a "loaded" IBM compatible for them to use. "I can't believe it—640K and a 20 megabyte hard disk for only \$1,200! It's great!"

Of course, occasional clouds cross his mind. "When you have one kid in college and another one headed there, you wonder, 'Am I making the right decision?' One week you're at work Monday morning with a big expense account, always out with publishers and sales reps—and the next week you wake up and you have to buy your own car, buy this, do that. Saturdays and Sundays begin to look like other days. But I'm not going back. I've got it good." **RE**

RESOURCES

Starting and Managing a Business from Your Home, United States Small Business Administration, Office of Business Development, Starting and Managing Series, Volume 102.

The Business Plan for Home-based Business, United States Small Business Administration, Office of Business Development, Management Aids Number 2.028.

How to Get a Job Working from Home, Paul and Sarah Edwards, two cassette tapes, Computer Entrepreneur Library, 26-07 Second St., Suite 3,

Santa Monica, CA 90405; \$20, plus \$2 shipping and handling.

Telecommuting Review: The Gordon Report, Telespan Publishing, 50 West Palm Street, Altadena, CA 91001; (818) 797-5482; subscriptions \$157 per year, \$5 for sample issue.

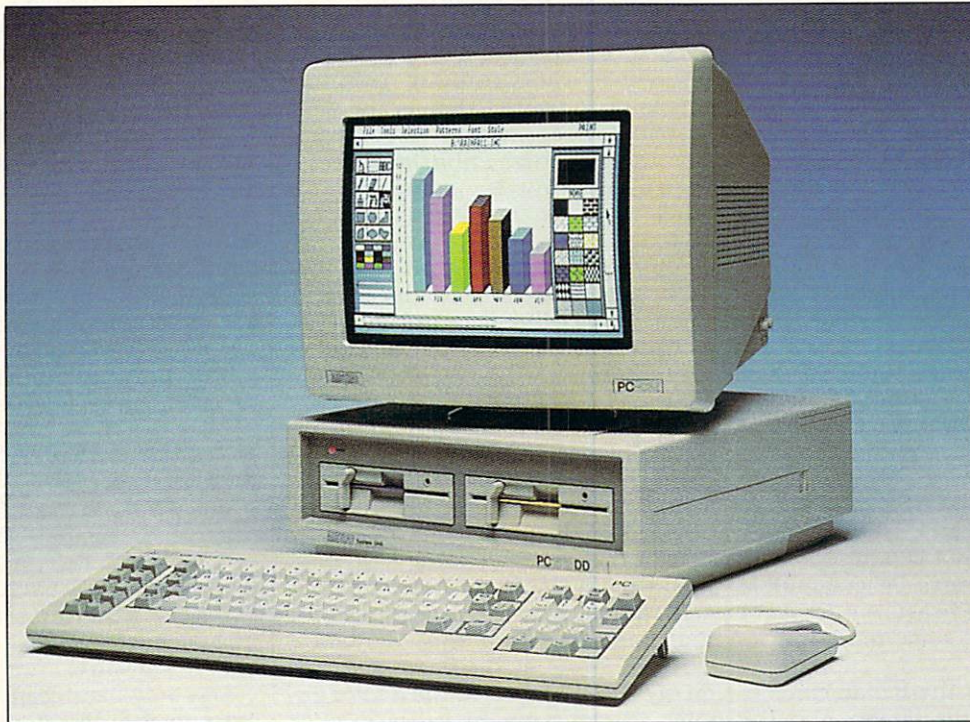
Independent Computer Consultants Association, National Office, 443 N. New Ballas, P.O. Box 27412, St. Louis, MO 63141; (314) 997-4633; \$160 per year for membership.

Association of Electronic Cottagers, P.O. Box 1738, Davis, CA 95617; (916) 756-6430 (on CompuServe, GO WORK).

The Amstrad PC1512

FROM GREAT BRITAIN: A UNIQUE PC CLONE WITH GEM GRAPHICS AND A MOUSE

BY STEVE MORGENSTERN



The Amstrad name will be familiar to those who have seen the British company's \$500 dedicated word-processing system at their local Sears store. Now Amstrad has launched a new invasion of the American continent with its distinctive IBM compatible, the PC1512. While the machine is new to the United States, it has reportedly been selling extremely well in Europe. The enthusiastic reception is easy to understand—the Amstrad PC1512 is priced right, comes out of the box ready to plug in and use, and offers a few noteworthy features not found on more traditional PC clones.

READY-TO-GO SIMPLICITY

The PC1512 has all the essentials and a few good options built right in. The system unit includes parallel and serial ports, plus a separate port for attaching the included Microsoft-

AMSTRAD FACTS

PRICE: \$799 (monochrome, one 5.25-inch floppy); \$999 (monochrome, two floppies); \$999 (color, one floppy); \$1,199 (color, two floppies); \$1,399 (monochrome, one floppy/one hard drive); \$1,599 (color, one floppy/one 20MB hard drive)

MEMORY: 512K (expandable to 640K)

CPU: 8086

SPEED: 8MHz

SLOTS: 3

SOUND: One channel, with volume control

GRAPHICS RESOLUTION: 640 x 200 (16 colors); 640 x 200 (monochrome)

PORTS INCLUDED: Serial, parallel, joystick, mouse, monochrome/color graphics video

HARDWARE INCLUDED: Clock/calendar, color or monochrome monitor, mouse

SOFTWARE INCLUDED: MS-DOS 3.2, DOS Plus, Locomotive BASIC, GEM Desktop, GEM Paint, Gem Doodle

compatible mouse. There's also a built-in clock/calendar that runs on four ordinary AA batteries. The unit comes with 512K RAM installed, and you can add another 128K to the motherboard without taking up an expansion slot. On the subject of slots, three full-size slots can be reached through a slide-off panel, so you don't have to dismember the whole computer just to add an expansion card. Three slots may not seem like much, but considering the built-in system features, most people won't need more.

The monitor, mounted on a swivel base, rests securely in a recess on top of the system unit. The monochrome monitor is sharp, and the color screen is adequate, although a bit blurry in text mode.

You can purchase the PC1512 with either a color or a monochrome monitor in one of three different disk-drive configurations: one floppy drive, two floppy drives, or one floppy and one hard-disk drive.

STEVE MORGENSTERN is a contributing editor for FAMILY COMPUTING.

The Amstrad comes with the Macintosh-like GEM system, the *GEM Paint* graphics program from Digital Research, and the MS-DOS 3.2 operating system. Unlike GEM running on the IBM PC in color graphics mode (which operates in monochrome only), the Amstrad version of GEM works in color. Additional software includes Digital Research's *DOS Plus* operating system, used primarily to run CP/M-86 software, and a GEM-based version of BASIC that works with windows and icons.

The chunky manual assumes the user knows absolutely nothing and adequately explains the setup procedure and the use of the system software. Sorting through the three different systems provided could be potentially confusing for the novice. The emphasis in the manual is on GEM, which is appropriate given the fact that a mouse is provided, and the system runs speedily enough (8MHz) to make GEM particularly desirable.

NOT JUST ANOTHER CLONE OF A CLONE

The PC1512 is not just another collection of off-the-shelf PC compatible parts. The system boasts a number of unusual features, some more important than others.

Not the least of these side benefits is silence. Both the floppy- and the hard-disk configurations of the PC1512 come without a fan, which on an ordinary IBM PC or clone is required to keep the system unit cool. This neat trick was accomplished by putting the heat-generating power supply inside the monitor. You plug the monitor into the wall, connect a power cable to a grounded electric outlet, connect a video output cable from the system unit to the monitor, and you're ready to go. As someone who cut his teeth on fanless Atari and Apple II computers, I find the constant whirring of the fan on the PC compatible I use regularly to be grating. In contrast, working at the Amstrad PC is a welcome relief.

Of course, putting the power supply in the monitor does have its downside—you must use an Amstrad monitor, and if your monitor breaks, you can't continue to use the computer by borrowing a friend's monitor. The color monitor we tested was all right as far as color and sharpness are concerned, but if you ever wanted to upgrade to an enhanced video display

like the EGA or the newly announced VGA standard, you're out of luck with an Amstrad (unless you set up your system with two monitors: the Amstrad for power and a higher-resolution monitor).

The second noteworthy feature of the PC1512 is speed. With an 8086 CPU running at 8MHz (versus 4.77MHz for the standard IBM PC), the Amstrad zips through its tasks. This speed advantage is particularly noticeable when running graphics-intensive software (such as the GEM system itself or page-layout programs like the *pfs: First Publisher*), and it didn't cause any compatibility problems with the many programs we tested.

Another welcome feature is a two-inch speaker with a volume control knob. This civilized control should be available on every PC, but is actually quite rare; and Amstrad deserves praise for including it.

Not all of the hardware features have practical significance, though. For example, Amstrad has included a joystick port on the back of the keyboard. Fine idea, but this connector takes a digital joystick (the kind used with Commodore and Atari computers) rather than the analog joystick that is standard for IBM-compatible systems. None of the game software on my shelf recognized the digital joystick. If you want to use a joystick with your Amstrad and not have to program your own software, you'll have to add a joystick controller card like everybody else.

The built-in graphics chip essentially conforms to the CGA standard. Even with a monochrome monitor, programs must be configured for a color system, and the monitor will display images in shades of gray, which is a big plus. To add a little sizzle, though, Amstrad tossed in an additional color graphics mode with 16 colors in high resolution, which is very attractive but not very useful. It looks great when used with the included version of *GEM Paint*. That's about the only time you'll see all those nice bright colors, however, since most off-the-shelf PC software doesn't support this nonstandard graphics mode.

Please note that neither the odd joystick port nor the extra color mode takes anything away from the Amstrad. Just realize that the built-in joystick control and enhanced graphics are not equivalent to an IBM-com-

patible joystick port or EGA graphics and should not weigh heavily in your purchase decision.

TESTING THE KEYBOARD

The Amstrad keyboard has a better feel than many PC compatibles', although it is not as firm and precise as the best of them. Helpful LED indicators are included on the CAPS LOCK and NUM LOCK keys. The enlarged L-shaped ENTER key and double-width right SHIFT key are just what I wanted; although the narrower left SHIFT, the placement of the ALT key right next to the CTL key, and the inclusion of a second, non-standard DELETE key—which doesn't function with standard software—are questionable, as is the small size of the lower-right DELETE key. Still, the unusual placement of several keys was easily mastered after a little hunting around the first few times at the keyboard.

A GOOD BUY FOR THE RIGHT BUYER

The Amstrad PC1512 is a speedy, capable PC compatible at a very reasonable price from a reliable manufacturer. The selection of built-in features is generous, especially the inclusion of a mouse and the GEM system software.

The only significant pitfall to consider is the nonstandard placement of the power supply in the display monitor. If you are pretty sure you will never want to upgrade your system to use a different display card and high-resolution monitor, then the power supply placement is a significant plus, since it eliminates the need for a noisy system fan. If you should want to move up to the EGA standard or beyond someday, then the Amstrad PC1512 system makes it difficult. **FC**

MORE TO COME FROM AMSTRAD

EDITOR'S NOTE: The PC1512 is no longer the only series of PC-compatible computers from this British company; they've recently introduced the PC1640 line with even more features. What most distinguishes this new line from its predecessor is a multifunction internal graphics adapter that includes EGA (enhanced graphics adapter) emulation. More to come on this series in the "Buyer's Guide to Computers" in the November 1987 issue.

Computing Families of the Year

CONNECTICUT AND CANADIAN FAMILIES SHARE GRAND-PRIZE HONORS

BY CHARLOTTE PIERCE



The Sweeneys of Canton, Connecticut (left to right): Jack, Bill, Judi, and Joy.

Judi Sweeney could have been speaking for many of the families who entered this year's Computing Family of the Year Contest when she wrote in her family's winning essay: "We are, I imagine, what the leaders of this industry envisioned as a 'computer family' when all this started. The computer is really an integral part of our everyday lives. It adds to our lives, but more important, it makes our lives easier and more creative. We can play games and plan for the future. We can encourage our children to do their best and present the products of their efforts in the best way possible. The computer allows us to aid and help others, to make new friends, to expand our career horizons, to play and have fun as a family, to keep track of an amazing variety of things . . . simply, to do more than we ever could have dreamed of doing without it."

The experiences of the families who wrote to us confirm that computers have permeated our personal and professional lives and have changed the way our children learn. The contest essays underscored an increased role of computers in home-based businesses as diverse as a fishing lodge in the Alaskan wilderness, a film-production company in Los Angeles, and a plumbing and heating service in New Jersey. And the people using computers are just as diverse, among them a 6-year-old ace programmer; a grandmother creating an on-line medical-research system; a farmer tracking grain yields; and a teacher helping special-education students learn to communicate.

CHARLOTTE PIERCE is managing editor of FAMILY COMPUTING.



The Foremans of Winnipeg, Manitoba, Canada (left to right): Richard, Derek, Brenda, Craig, and David.

These real-life examples confirmed once again what is so often stated: that computers really do make a difference. In fact, contest judges had such a tough time narrowing down the field, that *two* families were chosen as grand-prize winners: the Sweeneys, whose computer had an impact that touched not only their own lives, but their entire community; and the Foremans, who turned what could have been a disaster—a job layoff—into an opportunity, by establishing a successful computer-based home business that involved the whole family.

GRAND-PRIZE WINNER

THE SWEENEY FAMILY OF CANTON, CONNECTICUT

PRIZE: **Apple IIcs computer system including CPU, keyboard, mouse, 3.5-inch disk drive, RGB color monitor, and Image-Writer II printer**

A crime spree in West Hartford, Connecticut, proved disastrous to local criminals. Forensic detective Jack Sweeney used the overtime pay he earned chasing the crooks to upgrade his family's Apple computer system, and he set up databases to analyze the patterns of crime in his community. Much of the work was done in the Sweeneys' home office.

After that, the criminals didn't stand a chance. Jack's success in tracking them down convinced the department to install Apple IIe's for all the detectives, and Jack was recruited as a computer consultant to set up systems in neighboring police departments.

Knowledge of the computer also refueled Judi Sweeney's interest in her teaching career. "For me, the [computer] transformation began with personal filing and planning, and then everything blossomed," she said. "Both kids were in school, and I decided I just couldn't stay away from teaching any longer."

Judi returned to the teaching profession and has become the computer expert in a special-education facility. "Helping other teachers learn how to effectively use computers and become comfortable with them, and seeing the kids respond and discover their own creativity has added a great deal to my job satisfaction."

"Watching our kids, though, has been the best part of all of this," she emphasized. "The kids [Bill and Joy] have grown up with the computer; for them the computer in the house is like a television or a bed—it's just part of the scenery."

Bill, 11 years old and a seventh-grader, is in an accelerated and gifted program. Using a word processor to edit and revise stories, he has won several writing contests.

"From the day we first slipped *Counting Bee* into the drive, Bill has been fascinated with computers. He is very bright, and I can see him honing his problem-solving skills through his involvement," said Judi.

Joy, now 9, took a little longer to warm up to the computer. "It wasn't until *Dazzle Draw* and the mouse that we realized her real abilities were along more artistic

channels," said Judi.

The Sweeneys telecommunicate with family and friends via the GENIE network and use the computer to prepare their taxes, design a monthly calendar, and organize church records.

"We've seen computer enthusiasm spread to several neighbors on our street who now have their own Apple systems," Judi said. "We have built and cemented good neighborhood friendships just by sharing our computer knowledge."

GRAND-PRIZE WINNER

THE FOREMAN FAMILY OF WINNIPEG, MANITOBA, CANADA

PRIZE: Tandy 1000 TX computer system including CPU, keyboard, TXCM11 RGBI color monitor, 3.5-inch disk drive, and DMP 440 printer

Thanks to their computer, the Foremans have turned a bad situation into a chance to build a better life for their family. In March 1984, David Foreman was laid off from his job as marketing director of the local newspaper, the *Winnipeg Sun*.

Several years earlier, the Foremans had run their own marketing/advertising business with a staff of five. "We found we didn't enjoy it as much as we had envisioned,"

FIRST-PRIZE WINNER

OKIDATA MICROLINE 293
LETTER-QUALITY PRINTER



The Weavers of Westwood, New Jersey (clockwise from top): Sandi; Thom; Melanie, 20; grandson Joey, 1; John, 8; and Veronica, 21.

In 1984, Sandi and Thom Weaver decided to quit their 9-to-5 jobs to take over the family plumbing and heating business and start a freelance editing and proofreading service. The Weavers' office equipment consisted of a "rickety old electric typewriter and one ream of 20-pound bond paper," said Sandi.

They asked around, and a friend in corporate-computer sales recommended an IBM PC XT for their operation. "He set us up with *dBase III*, *Symphony*, *Leading Edge Word Processing*, and a 20MB hard drive," Sandi recalled, "more than enough power for a smooth start."

"Three years ago, the volume of work we now handle in a day couldn't have been done in less than a week," she added.

And the computing activity doesn't

stop there: the seven Cub Scouts in John's troop, Todd's friends, six college-age friends of the girls, Veronica's boyfriend, and Thom Weaver's plumbing mechanics all take their turns at the Weaver IBM.

SECOND-PRIZE WINNER

HAYES SMARTMODEM 1200
AND SMARTCOM II SOFTWARE



The Gallands and Phelps of St. Simons Island, Georgia (left to right): Bob; Paula; Brad, 8; Mo, 6; GG, 65; and Max, 10.

"In our family, we have almost as many generations using computers as there are generations," Paula Galland told FAMILY COMPUTING.

"When Bob fell in love with computer games, he stopped watching football on Saturdays," Paula said, "and my computer involvement began while I was working on a graduate degree in educational media in 1981. By the end of one course, I was one of the class members begging their administrators to buy microcomputers for their schools."

Paula's mother, GG Phelps, returned to college in her fifties; she began working full-time, for the first

time ever, in her sixties. She developed and now directs on-line medical research at the Athens Regional Medical Center, while her husband, Mo, manages databases and does mailings for his travel business with his Apple IIc at home.

"And Mother worried that Daddy would be bored after he retired as director of admissions at the University of Georgia!" Paula quipped. "The two of them probably use computers more than any 65-year-old couple in the country now."

THIRD-PRIZE WINNER

TANDY 102 LAPTOP COMPUTER



The Dixons of Lake Creek, Alaska (left to right): Carl; Carly, 3; Amanda, 5; and Kirsten.

There are no roads to the Riversong fishing lodge near Mt. McKinley in the south-central Alaskan wilderness. The Dixons must boat 18 miles up the Yentna River to meet the mail plane that flies in from Anchorage each week. A small diesel engine generates the electricity to run the family's home and business operations and power its Compaq Deskpro PC.

admitted Brenda Foreman, "so we closed it down." When David was laid off, the Foremans decided to try it again, "but without any staff, just the two of us, with the office in our home. Our company, Signal Marketing Services, was reborn.

"This has been our best year ever for the business, and I really believe we couldn't have made a go of it without the computer," David Foreman told FAMILY COMPUTING. "We have become increasingly proficient and jokingly call our Tandy 1000 our 'silent partner,' the one that never asks for more money and never takes coffee breaks."

"Our computer gives us phenomenal flexibility and eliminates the need to hire a full-time typist," Brenda confirmed. "It's a snap to create and revise documentation and graphics presentations for clients."

"For example, for one of our clients, we maintain a database of more than 1,400 sales leads and make up separate packages for each of their 18 sales representatives." Brenda explained how she and David use programmable database software to select and analyze specific data from demographic surveys and use it to support marketing recommendations they make to clients.

"The fun of it all is that Dave and I have different interests in the computer," Brenda said. "For instance, Dave loves programming in BASIC and working with graphics; my interest lies in understanding the [MS-DOS] operating system and how to manipulate it, plus having a

good comprehension of the logic inherent in computer programming. He programs; I debug. Between the two of us, we seem to accomplish what we need to."

For 11-year-old Craig Foreman, the computer has been a major factor in improving a visual-tracking problem and harnessing hyperactive behavior that emerged when he started school. According to Brenda, "the computer is nonjudgmental and nonthreatening, and Craig enjoys using it. He gets extra time on the computer when he does well, and that's a big incentive."

The computer is a natural learning vehicle for the other two Foreman boys, Richard, 7, and Derek, 10. "Richard is a very curious youngster," Brenda said. "He was 2 years old when we got our first computer, and he would look on with his brothers. Before I knew it, he was reading, printing, and even doing some programming."

Derek prefers to experiment with computer graphics and programs that encode and decode messages and recently produced forms for his science-fair project.

"We even bought David's parents a CoCo, and they do their budget on it," Brenda said. "Having lived the electronic cottage that we used to read about, we would not have it any other way."

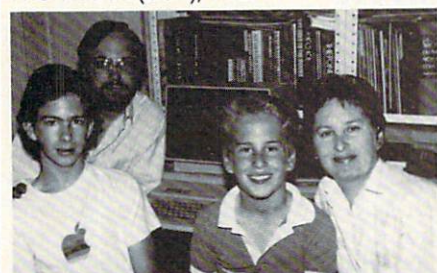
EDITOR'S NOTE: To fit in with the Foreman's "family" of Tandy computers, we added the TX system (see preview on page 43) to the contest as their grand prize.

"We had never been in business for ourselves, and our accounting system was literally a shoe box," said Kirsten Dixon. "We kept track of information, such as guest days and reservations, in a notebook. Considering our business needs and our responsibility for our children's education, we felt it was time to buy a computer. Our girls will be as familiar with computers as they are with fishing poles or pairs of skis."

"We've found that computers in the wilderness aren't improbable, and in this little log cabin on the Yentna River, they are here to stay."

FOURTH-PRIZE WINNER

HOME-CONTROL SYSTEM
FROM X-10 (USA), INC.



The Engles of Los Angeles, California (left to right): Matthew, 15; Harrison; Christopher, 11; and Marilyn.

"Our computing experiences started with our children's involvement with an Apple IIe five years ago, and we very quickly saw its applications for our business," Harrison Engle told FAMILY COMPUTING.

The Engles' film-production business is constantly expanding and

contracting, but they have been able to accurately track equipment, salaries, and other expenses with a spreadsheet on their Apple IIe. "We couldn't do without it now," Harrison said.

Marilyn Engle, a film writer, "uses the computer almost constantly" to produce scripts for technical medical films and teachers' guides.

Adds Marilyn: "Our sons have taken to the computer as if they were born to it, and we are all computer pushers, encouraging friends to use them, giving advice to those who are considering buying computers, helping them to decipher new programs."

FIFTH-PRIZE WINNERS

\$100 WORTH OF SOFTWARE

The BARBER family of West Des Moines, Iowa; The FORSYTHE family of Menomonie, Wisconsin; The MAY family of Claremore, Oklahoma; The WRIGLEY family of Vallejo, California.

SIXTH-PRIZE WINNERS

SUBSCRIPTION TO COMPUSERVE
INFORMATION SERVICE

The BEALS of Brunswick, Maine; the DIALS of West Frankfort, Illinois; the ERICSONS of Cannon Falls, Minnesota; the LOWES of Fawn Grove, Pennsylvania; the MOORES of Cohasset, Minnesota; the RAZZANOS of Ontario, California.

SEVENTH-PRIZE WINNERS

NEW OR EXTENDED SUBSCRIPTION TO
FAMILY COMPUTING

The DEETERS of Cochranton, Pennsylvania; the EHLERS of Greensboro, North Carolina; the FENGLERS of Clay, New York; the GILLES of East Greenwich, Rhode Island; the HARDENS of Wilmore, Kentucky; the HENRYS

of Marquette, Michigan; the HICKS of Winter Park, Florida; the LAIRDS of Whitehorse, Yukon Territory, Canada; the MAKIN-BYRDS of Johnstown, Pennsylvania; the MCGOWANS of Dighton, Kansas; the MULVEYS of Chula Vista, California; the PUTNAMS of Blaine, Minnesota; the TANAKAS of Stockton, California; the WILSONS of Beaver, Oklahoma.

EIGHTH-PRIZE WINNERS

FAMILY COMPUTING TOTE BAG

The BELFRAGES of Aiea, Hawaii; the BOEMKERS of Sepulveda, California; the CHAMBERS of New Orleans, Louisiana; the COUSSOULOS and WOLFFS of Reston, Virginia; the DONATELLIS of Mendon, Massachusetts; the FELDSTEINS of Amherst, Massachusetts; the GERSICS of Great Falls, Virginia; the GILLES of Raleigh, North Carolina; the HILSTONS of Avon, Ohio; the IRIZARRYS of Alexandria, Virginia; the JAMESSES of Graham, Washington; the KOWALICS of Springfield, Virginia; the KOSKIS of Nashville, Tennessee; the MCGOVERNS of Idaho Falls, Idaho; the MIOTKES of Muskego, Wisconsin; the ROACHES of Manalapan, New Jersey; the SLOANS of Wewoka, Oklahoma; the SUAREZES of San Francisco, California; the TEJEDAS of Tucson, Arizona; the ZEALBERGS of Marion, Virginia.

COMPANIES CONTRIBUTING PRIZES

FAMILY COMPUTING would like to thank the following companies for the prizes they contributed to the contest: American Educational Computer Inc.; Apple Computer; Batteries Included; CBS Software; CompuServe Information Service; Epyx, Inc.; Hayes Microcomputer Products, Inc.; The Learning Company; Okidata; Peachtree Software; Random House Software; Sams Software; Scholastic Inc.; Sierra Adventure; Sirius Software, Inc.; Strategic Simulations Inc.; SubLogic Corp.; Tandy Corp.; The Thoughtware Company; X-10 (USA) Inc. **FC**

Keyboard Alternatives: The Mouse And The Trackball

OR, THERE'S MORE THAN ONE WAY TO CONTROL YOUR COMPUTER

BY STEVE MORGENSTERN AND DAVID HALLERMAN

If your computer didn't come with a mouse—as the Macintosh, Amiga, Atari ST, and Apple IIGs do—you might be wondering what all the fuss is about. Do you really need a mouse? Should you want one? Which are the best ones? Read on for answers.

And if you already own one of those mouse-based machines, you'll want to read on, too, because someday you'll probably need a replacement for your current mouse.

WHAT CAN A MOUSE DO THAT A KEYBOARD CAN'T?

After you've worked with a computer for a while, shuttling the cursor around the screen seems like second nature. You press the left arrow key to make the cursor move to the left, the up arrow key to make it move upwards, and so on. The pattern is clear and obvious.

A mouse can also control the cursor's movement, but many people find that it's an enhancement for the keyboard, not a substitute. Peter K. Ristau, an electrical contractor who lives in northern Virginia, makes extensive use of a mouse on an IBM AT compatible. He said, "While I'm a good typist, I find a blending of mouse-controlled cursor positioning and direction-key use essential in many of the large spreadsheets I fabricate. I've heard some good arguments about the time-and-motion loss of removing your hands from the

keyboard to use the mouse. However, in practice it can be as natural as using a shift key or typing numerals. Yet I wouldn't think of trading my keyboard for a mouse, nor would I substitute cursor keys for my mouse when formatting large bodies of text or spreadsheets. To me, a mouse is a tremendous time-saving productivity tool."

Moving the cursor around a word-processed document or between fields in a database is akin to pointing with your finger, which is why with the new Personal System/2 series from IBM, they call the mouse a "pointing device." However, pointing is not the only purpose for a mouse; in many cases, it can also be used as a substitute for function keys, giving commands to your programs. A friend of ours uses a Logitech mouse with Microsoft Windows and PageMaker on his PC clone. He thinks that together a mouse and a keyboard "maximize" his productivity. "In most instances, if it is faster to invoke a function via the keyboard, then I use the keyboard," he said. "But if it is faster (or only possible) via the mouse, then I use the mouse—without consciously debating in my mind which option to use. In other words, I may have my left hand on the keyboard and my right hand on the mouse, and I work with these in an integrated fashion with moves approaching the least effort."

WILL MY SOFTWARE WORK WITH A MOUSE?

With mouse-based computers such as the Macintosh, almost every single

software package is designed to work with a mouse. On other computers, like the IBM PC or compatibles, some types—or brands—of software are more amenable to mouse-control than others. For example, paint programs often support a mouse, but that's still an uncommon feature with many word processors. Another example: The *SuperCalc* spreadsheet does not come with mouse support, but Microsoft's spreadsheet, *Multiplan*, does; that's because Microsoft—an important software publisher and one of the main mouse manufacturers—strongly supports mouse use.

In truth, as helpful as a mouse can be, it's useless unless your software works with it. As use of the mouse grows in popularity, greater numbers of productivity packages are beginning to support various brands of mice. But even if your software doesn't already work with a mouse, you can often add mouse control with special programs called "drivers." These utility programs are bundled with several units we reviewed. You run the driver program just before starting the application program you want to control with the mouse. A driver, for instance, can add mouse capabilities to a specific program not designed with a mouse in mind, such as Lotus 1-2-3. Some software, like *PC-Write*, comes with drivers that support several brands of mice. And some mice, such as the PC Mouse and the Logitech Mouse, come with their own systems to help you create mouse-based pop-up or pull-down menus for entering commands into programs that have no mouse control.

THE DOWNSIDE OF THE MOUSE

Not everyone who has used a mouse likes one, especially many experienced touch typists. As Don Watkins, a sysop (system operator) on the IBMNET forums on CompuServe who lives 60 miles north of San Francisco, said, "I've got a rat, but very rarely use it. As a touch typist who can clip along at close to 90 words per minute, taking my hands off the keyboard is a killer. Not only does it slow my keyboarding down, but it also slows down my productivity."

Before adding a mouse to your system, try one out with software if you can. But even with a tryout, nothing substitutes for living with a mouse; only then can you know whether or not it will improve your productivity. It's a good thing, then, that most mice are reasonably priced; that way,

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you might be able to experiment.

Also, if your desk tends to be messy, you might have trouble maneuvering a mouse. Watkins continued, "Then there's the problem with desktop space which is always critical. I never seem to have enough room to roll the critter around."

TRACKBALLS: A MOUSE ALTERNATIVE

If your desk is also too cluttered to navigate a mouse across, you might want to consider a trackball: a stay-in-one-spot alternative that can, in many instances, perform the same cursor-movement control functions. In fact, even if your computer came with a mouse, you might want to add a trackball.

A trackball shares many mouse strengths (although we found that trackballs work better for large movements and mice for smaller, tightly controlled motions). In essence, a trackball is a mouse turned upside-down. However, instead of moving

the whole unit in order to make a little ball turn around, a trackball turns the box over, makes the ball bigger and hard like a billiard ball, and lets you turn it directly. In both cases, as the ball moves, your on-screen cursor moves proportionally, yet a trackball uses up far less desk space. You inevitably come to the edge of either your desk or your reach with a mouse; then you have to lift it and place it down again to move the cursor further in the same direction. With a trackball, you can just keep spinning until your cursor gets to where you want. In most instances, if a program can be operated by a mouse, it will work with a trackball.

SHOPPING HINTS: FEATURES, FUNCTIONS, AND FASHION

In order to make best use of the accompanying product charts and to make your best buy in the store, you'll want to be aware of these basic features and functions.

Mouse. How many buttons does the

fashionable mouse need? While the question may be moot for a Macintosh or an Apple II (one is all you get), it's of real concern for those working with an IBM PC or compatible. Depending on the mouse model, you'll find from two to six buttons. Is more better? Not necessarily; Apple thought the simplicity of one button best, and the Amiga and Atari ST find two enough for their mice. More might be confusing, and buttons beyond two can often be used only with the rare programs written to support them. Yet with a six-button mouse, the MultiMouse, you can press buttons in different combinations to enter letters, numbers, and control keys directly from the unit, all without touching the keyboard. Don't misunderstand—for everyday use, this technique will never substitute for typing. However, if you're drawing diagrams and want to add labels, or you need to type a short entry (a file name, for instance) in a mouse-controlled program, or if you're in some



1351 Mouse (Commodore Business Machines)

Logitech Mouse (Logitech)

MultiMouse (American West Engineering)

microLYNX (Honeywell)

Turbo Mouse (Kensington Microware)

Microsoft Mouse (Microsoft Corporation)

way handicapped, this unusual unit will get the job done.

When shopping for a mouse for an IBM PC or compatible, you need to consider how you'll connect the unit to your system. Most models come in two varieties: a serial type that attaches to your serial port and a bus version that comes with its own interface card (a "bus" is the channel between your computer's microprocessor and the rest of the system). Each has advantages and drawbacks. The serial type is easier to attach; just plug it into the port. But then you can't use the port for your modem, too, without the expense and

clutter of a switch box. A bus mouse alleviates the serial congestion, but at the cost of a (perhaps precious) slot. The Microsoft Mouse offers a third way to connect, Microsoft's own InPort standard, which is available with the company's Mach 10 accelerator card.

PC owners also need to consider software compatibility with the different brands of mouse devices. Not all mice are alike; therefore, some programs work with one mouse, but not another. For example, the Microsoft Mouse works with Microsoft's own programs, such as *Word*, but it may not work with your writing tool.

And because of the popularity of the Microsoft Mouse, other brands of mice—such as the Logitech Mouse—are compatible with it. Consider hardware compatibility, too; most mice will work with most clones, but not always. Examine documentation thoroughly before putting your money down.

One last thing to consider: The majority of mice, like the original Macintosh mouse, are mechanical mice. That is, they convert the mechanical movements of a rubber ball rolling against rollers into electronic data that the computer can measure. However two mice, the PC Mouse and the A+ Mouse from Mouse Systems, have no moving parts at all. Instead, an LED shines on a roughly 8-inch-by-9-inch mirrorlike pad printed with grid lines, and the system reads your movement optically. The company claims that this method makes the unit last longer than mechanical mice and backs up its contention with a generous lifetime warranty. In use, these optical mice are smoother than most mechanical ones, but the difference is subtle. The only real drawback is the need for the metal pad.

Trackball. While not as ubiquitous as mice, trackballs have also made the journey from arcade to office. They let you move the cursor faster than with a mouse, but some users feel control is not quite as precise. Better designed trackballs force the cursor to move more rapidly the quicker you turn the ball and to move more slowly when you slow up.

How many buttons here? The LYNX (Honeywell) ball for the PC gives you three, and you can program them as additional function keys; while the Macintosh LYNX ball has two, and they're not programmable (but one does lock in the down position, for functions such as dragging). The Turbo Mouse (Kensington's name for its trackball) for the Apple or the Mac also has two buttons; in this case, the second button serves only as a convenience for lefties; otherwise they're functionally the same.

IS THERE A MOUSE IN THE HOUSE?

While they're not for everyone, mice and trackballs are here to stay. As applications such as desktop publishing increase in prominence and as Macintosh-like graphical interfaces such as *Windows*, *GEOS*, and *GEM* grow in popularity, more and more computer users will find that they want to invite a mouse into the house. ☐

A SELECTION OF COMPUTER CONTROLLERS

You don't need to stick with the cursor control keys on your computer's keyboard if you add a mouse or a trackball to your system. And even if a mouse came with your machine, you might want to try a trackball or an alternative mouse. Products are listed alphabetically by manufacturer within type. Most units that work with the IBM PC/XT/AT series of computers will work with PC compatibles, but to be sure, check with your dealer or the computer's manufacturer.

Mice

Model/Manufacturer/Price	Hardware	Remarks
MultiMouse American West Engineering (801) 484-1973 \$289	IBM PC/XT/AT, IBM PS/2.	While this six-button mouse functions the same as an ordinary mouse, it can also let you enter letters, numbers, and other characters without using the keyboard.
1351 Mouse Commodore Business Machines (215) 431-9100 \$50	C 64/128.	A two-button mouse that can substitute for a joystick (good for paint programs) or act like a normal mouse with programs that use a mouse, like the GEOS series. With precise, multidirectional control.
Logitech Serial Mouse Logitech Bus Mouse Logitech (415) 365-9852; \$99 each \$119 (with "Plus" software) \$149 (with "Plus" and paint software)	IBM PC/XT/AT, IBM PS/2.	Three-button units with a smooth roller-ball mechanism and a comfortable feel. "Plus" version adds software that enables you to create pull-down menus to enter commands into programs. Compatible with standard mouse drivers, such as the Microsoft mouse.
Microsoft Mouse Microsoft Corporation (206) 882-8080 \$125 (InPort) \$175 (bus) \$195 (serial)	IBM PC/XT/AT, IBM PS/2.	Compact, two-button mouse that comes with two programs—a capable paint package and a utility for creating on-screen "slide shows." Only three mouse drivers are included, however, with no way to make your own.
A+ Mouse PC Mouse Mouse Systems (408) 988-0211 \$159 (serial; A+) \$179 (bus)	Apple IIe/IIc/IIGs, IBM PC/XT/AT, Macintosh.	No moving parts make these units special. Instead, an LED shines on a mirrorlike pad imprinted with grid lines; the system reads your movement optically. Comes with software library of 23 mouse-based menus for controlling your programs (PC mouse only).

Trackballs

comLYNX microLYNX Honeywell Disc Instruments (714) 979-5300 \$169	IBM PC/XT/AT.	The microLYNX connects via the keyboard outlet, the comLYNX to the serial port. Both come with software that adds control to programs that normally work with the keyboard only. The three buttons can be set up as function keys, too.
quadLYNX Honeywell Disc Instruments (714) 979-5300 \$129	Apple IIe/IIc, Macintosh.	As a direct replacement for the Apple mouse, this trackball saves desk space while performing the same job as the mouse. Really sends the cursor flying.
Turbo Mouse Turbo Mouse ADB Kensington Microware (212) 475-5200 \$129	Apple IIc (IIe with mouse card), Macintosh 512K/ Plus, Apple IIGs, Macintosh SE/II (ADB version).	Any software that works with a mouse will work with this trackball. Both devices can be set up at the same time, since this unit plugs into the mouse port, and the mouse plugs into this unit. Then you switch back and forth depending on needs.

NEW HARDWARE & ACCESSORIES

EPSON EYES THE HOME-OFFICE MARKET

EDITOR'S NOTE: *The following hardware announcement is based on literature received from the manufacturer. It is not a product review.*

MANUFACTURER: Epson America Inc.
ADDRESS: 2780 Lomita Boulevard,
Torrance, CA 90505; (213) 539-9140
or (800) 421-5426
PRICES: computer (\$900); printer
(\$269); electronic typewriters (\$250–
\$600)

Epson America is working hard to become a household name. While its name isn't as recognizable as Sony, Panasonic, or Honda, Epson is probably the best-known manufacturer of printers. The company hopes that this popularity will help to get several newly introduced products into the estimated 20 million home offices across the country. The company's new products include Apex, an IBM PC-compatible computer; the LX-800, a dot-matrix printer; and the Elite Plus series of electronic typewriters. Here are brief descriptions of these products:

Apex Computer

Unlike Epson's Equity line of IBM-compatibles, the Apex computer is being sold through mass merchandisers; it's aimed at people who don't need computer-store expertise but who are attracted to familiar brands. Apex comes with 512K of memory (expandable to 640K), dual



The Apex computer is priced at \$900. The system shown here also includes a \$130 monitor and a \$269 LX-800 printer.

360K floppy disk drives, a parallel port, and a color graphics adapter. It has three full-length expansion slots (one of which is occupied by a CGA card), a detachable AT-style keyboard, and an internal speaker. Apex comes bundled with MS-DOS 3.2, GW-BASIC, and Software Publishing's *pfs: First Choice*, an integrated word processor, spreadsheet, database, and communications package. A 12-inch composite monochrome monitor or 13-inch RGB monitor is available for an additional \$130 or \$400, respectively. The computer's suggested retail price is \$900, and it's covered by a one-year limited warranty.

LX-800 Printer

The LX-800 is a 9-pin dot-matrix entry-level printer that Epson introduced to accompany its Apex. The \$269 printer runs at 180 characters per second (cps) in the elite draft mode and at 30 cps in the elite near-letter-quality mode. It includes a built-in tractor feed, a 3K buffer, automatic single-sheet loading, and a parallel interface. The front control panel lets users select fonts, type styles, and pitches without the annoyance of changing DIP switches. The LX-800 is IBM compatible and is covered by Epson's one-year limited warranty.

Elite Plus Electronic Typewriters

Epson has also introduced a line of typewriters with word-processing functions that could appeal to college students, home-business owners, and traveling professionals. The least expensive model, the \$250 Elite 100 Plus, comes with 8K of memory, a 35,000-word dictionary, a word-correct feature, and a FIND function. Measuring 2.5-by-14.5-by-12 inches and weighing 8.8 pounds, the daisywheel typewriter prints at 17 cps and has a standard keyboard format with 58 keys. The 100 Plus includes an AC adapter and accommodates an optional Ni-CAD battery pack for portable operation.

The second model, the Elite 300

Plus has all of the features of the 100 Plus, as well as a 75,000-word dictionary/thesaurus and memory that can be expanded to 16K or 40K. This \$370 model also has a one line-by-20-character liquid crystal display (LCD) for viewing text before printing.

The Elite 350 Plus has all of the features of the 300, plus a heavy-duty printing mechanism and a full-size 14.5-inch carriage. The \$600 daisywheel typewriter comes with 16K of memory (expandable to 24K or 32K) and prints at 14 cps. The 21-pound typewriter features a one-



The Elite 400 Plus typewriter can connect to a monitor or a modem.

line-by-34-character LCD and has a built-in parallel interface for use with a computer printer.

The Elite 400 Plus (\$500) is a whisper-quiet thermal-transfer typewriter that prints at 25 cps. With an eight-line-by-40-character LCD and pop-up menus for convenient editing, the typewriter has 32K of memory (with optional 8K and 32K memory cards) and 14 included fonts. An optional interface is available for connecting a monitor or modem. Weighing 7.5 pounds, the 400 Plus measures 2-by-12.5-by-10.5 inches. It includes an AC adapter and uses four optional D-cell batteries.

Epson has also introduced four Smart Application Cartridges for the models 300 Plus, 400 Plus, and 350 Plus. Slightly larger than credit cards, these \$60 cartridges contain approximately 100 preformatted letters and forms that can be used and customized for business and personal correspondence.

All of the Elite Plus electronic typewriters come with carrying cases and are covered by one-year limited warranties. **FE** —STEPHANIE ESTERS

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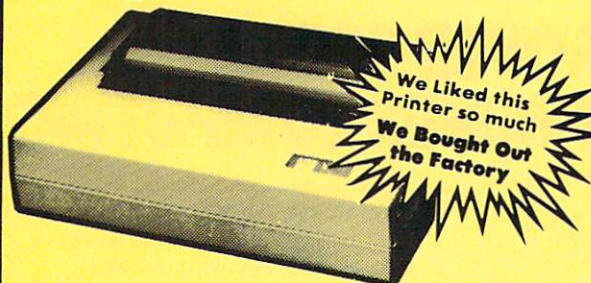
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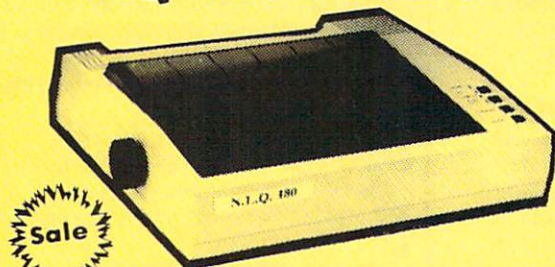
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| • Commodore 64 Computer | \$299 ⁰⁰ |
| • Commodore 1541c Disk Drive | \$229 ⁰⁰ |
| • Hi-Res 12" Monochrome Monitor | \$249 ⁰⁰ |
| • Monitor Cable | \$ 19 ⁹⁵ |
| • Big Blue 8½" Printer with
Interface and 2 rolls of paper | \$199 ⁰⁰
\$ 49 ⁹⁵ |

Total Prices

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List \$1124

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- | | |
|--|--|
| • Atari 130XE Computer | \$249 ⁰⁰ |
| • Atari 1050 Disk Drive | \$299 ⁰⁰ |
| • Hi-Res 12" Monochrome Monitor | \$249 ⁰⁰ |
| • Monitor Cable | \$ 19 ⁹⁵ |
| • Big Blue 8½" Printer with
Interface and 2 rolls of paper | \$199 ⁰⁰
\$ 49 ⁹⁵ |
| • Premium Word Processor | \$ 59 ⁹⁵ |

Total Prices

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SOFTWARE GUIDE

Welcome to FAMILY COMPUTING's Software Guide, the most comprehensive listing available of two dozen of the newest, most noteworthy, and/or best programs on the market. Our reviewers include families from all over the country who have judged the software according to the following criteria: long-term benefits and applications, adaptability, and advantages of using a computer for a given task. Programs have been evaluated and rated for their performance in each of the categories listed below. More detailed reviews follow the chart. Unless otherwise noted, all programs are in disk format, and minimum memory requirements are 48K for Apple II series, 48K for Atari, 128K for IBM PC/PCjr or compatibles, and 128K for Macintosh. "Atari" alone denotes the 800/XL/XE series. "C 64/128" means the software will run on both a C 64 and a C 128 computer in C-64 mode; "C 128" alone means the software will run only on that machine.

Here's a rundown of the rating categories and what they mean: **O** = Overall performance, given the limitations and capacities of the particular computer for which the software is intended. **D** = Documentation, or the instructions and literature that accompany a program. **EH** = Error-handling, the software's capacity to accommodate errors made by the user—an especially important consideration with software for younger users. **PS** = Play system (in the games reviews), the quality of the game design and the game's playability. **GQ** = Graphics quality, also evaluated in light of each particular brand's graphics capabilities. **EU** = Ease of use after the initial learning period, which varies from computer to computer. **V** = Value for money, or how the software measures up to its price.

HOME BUSINESS & PRODUCTIVITY

Title Publisher Price	Brief description	Hardware/ Equipment required	Backup policy	Ratings					
				O	D	EH	GQ	EU	V
BOXCALC 1000 Cotton Software, Inc. 2325 Anderson Road, #364 Covington, KY 41017 (606) 727-1600 \$139 ©1987	Combines a standard word processor with math functions similar to those of a spreadsheet, but that deal with individually numbered cells called "boxes." Tedious to set up, and the manual is poorly organized. —SUMMERS	256K IBM PC.* 384K recommended. 2nd drive, color monitor optional.	90-day warranty. Not copy-protected.	★ ★	★	★ ★ ★	N/A	D	★ ★
DINNER AT EIGHT Rubicon Publishing 2111 Dickson Drive, #30 Austin, TX 78704 (512) 448-4133 \$60 ©1985, 1987	An electronic cookbook that comes with a smorgasbord of gourmet recipes, plus you can add your own. Also prints out complete menus and shopping lists. For serious cooks.—SUMMERS	Reviewed on 256K IBM PC.* Also for 64K Apple, Macintosh. 2nd drive.	90-day warranty. Not copy-protected.	★ ★	★ ★	★ ★ ★	★ ★	A	★ ★
INLINE Compusense 55 Constitution Drive Bedford, NH 03102 (603) 472-2088 \$50 ©1986	A useful tool for creating traditional Harvard outlines (roman-numeral heads, capital-letter subheads, etc.). Especially noteworthy: transfers outlines to most word processors.† —MORGENSTERN	256K IBM PC.*	90-day warranty. \$20 thereafter. Not copy-protected.	★ ★ ★	★ ★ ★	★ ★ ★	N/A	E	★ ★ ★
PAINTWORKS PLUS Activision 2350 Bayshore Parkway Mountain View, CA 94043 (415) 960-0410 \$80 ©1986	Designed just for the IIGs, this paint program takes advantage of that computer's rich palette with 4,096 available colors. Particularly easy to use, and it does animation, too. —FRANK	512K Apple IIGs. 3.5-inch drive.	90-day warranty. \$7.50 thereafter.	★ ★ ★ ★	★ ★ ★ ★	★ ★ ★ ★	★ ★ ★ ★	E	★ ★ ★ ★
PALANTIR WORD PROCESSOR Palantir Software 12777 Jones Road, #100 Houston, TX 77070 (713) 955-8880 \$395 ©1984, 1986	Power in a word processor means a generous collection of features, and that's what you get in this business-class writing tool. Includes mail merge and automatic hyphenation. —SUMMERS	256K IBM PC.* 2nd drive.	10-day warranty. Not copy-protected.	★ ★ ★	★ ★ ★	★ ★ ★	N/A	A	★ ★ ★
PC TALK4 Headlands Communications Corp. 1624 Tiburon Blvd. Tiburon, CA 94920 (415) 435-0770 \$99 ©1983, 1986	The erstwhile shareware communications program is better than ever in its new commercial format. It's practically foolproof, thanks in part to all the user input it received during its formative years. —SUMMERS	192K IBM PC.*	90-day warranty. Not copy-protected.	★ ★ ★	★ ★ ★	★ ★ ★	N/A	E	★ ★ ★ ★

RATINGS KEY **O** Overall performance; **D** Documentation; **EH** Error-handling; **GQ** Graphics quality; **EU** Ease of use; **V** Value for money; **○** Poor; **★** Average; **★★** Good; **★★★** Very Good; **★★★★** Excellent; **N/A** Not applicable; **E** Easy; **A** Average; **D** Difficult; **†** Longer review follows chart

*Titles listed for the IBM PC/PCjr will also run on many IBM PC compatibles; owing to the proliferation of compatibles, check with the publisher of the program or your dealer for compatibility.

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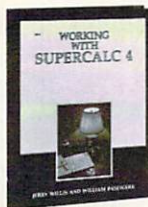
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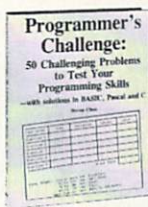
2771 \$25.95



2814 \$24.95



2618P \$21.95



2837 \$29.95
Counts as 2



1085P \$10.25



1160P \$10.95



2754 \$28.95
Counts as 2



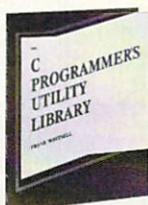
2831 \$22.95



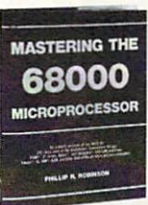
2892P \$16.95



1295P \$10.25



2855 \$24.95



1886 \$22.95



2688 \$26.95
Counts as 2



2838 \$19.95



1251P \$10.25



1993 \$21.95



2852 \$25.95



1970 \$22.95



2628P \$18.95



1718P \$15.50



2745 \$24.95



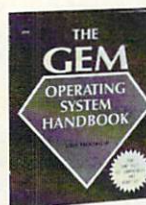
2627P \$17.95



2862 \$19.95



2748 \$21.95



2742 \$23.95



1873P \$17.95



1997 \$21.95



2798 \$26.95
Counts as 2



1479P \$13.50



2730 \$27.95
Counts as 2



1990 \$24.95



2791 \$21.95



2692 \$27.95
Counts as 2



2793 \$22.95



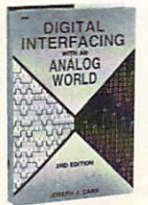
2654 \$18.95



2840 \$24.95



2872 \$19.95



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HOME BUSINESS & PRODUCTIVITY

Title Publisher Price	Brief description	Hardware/ Equipment required	Backup policy	Ratings					
				O	D	EH	GQ	EU	V
RAPIDFILE Ashton-Tate 20101 Hamilton Ave. Torrance, CA 90502 (213) 329-8000 \$395 ©1986	A small-business database manager with a built-in word processor. Useful for inventory, accounts receivable and payable, form letters, mailing labels, check writing, and much more.† —MORRIS	256K IBM PC.* 2nd drive.	90-day warranty. Not copy-protected.	★ ★ ★ ★	★ ★ ★ ★	★ ★ ★ ★	N/A	A	★ ★ ★ ★
SCRIBBLE! Micro-Systems Software 12798 W. Forest Hill Blvd. West Palm Beach, FL 33414 (305) 790-0770 \$100 ©1986	Easy to control yet full-featured word processor includes spelling checker, mail merge, and sophisticated print commands (such as headers, footers, and on-screen preview). Suitable for families and small businesses. —SUMMERS	512K Amiga.	30-day warranty. Not copy-protected.	★ ★ ★ ★	★ ★ ★ ★	★ ★ ★ ★	N/A	E	★ ★ ★ ★
SUPERBASE PERSONAL Progressive Peripherals & Software, Inc. 464 Kalamath St. Denver, CO 80204 (303) 825-4144 \$80–\$150 ©1986	Your files can be as large as your disk storage allows with this easy-to-use database. Helps you to organize and display graphics as well as text, and you can work with several files simultaneously. —SUMMERS	Reviewed on 512K Amiga. Also for Atari ST, IBM PC.* 2nd drive optional.	90-day warranty. Not copy-protected.	★ ★ ★ ★	★ ★ ★ ★	★ ★ ★ ★	★ ★ ★ ★	A	★ ★ ★ ★
SUPERPAINT Silicon Beach Software 9580 Black Mountain Road San Diego, CA 92126 (619) 695-6956 \$99 ©1986	An advanced successor to the classic MacPaint program. It adds the object-oriented features of MacDraw for better control and resolution (especially with laser printers).† —TERRY	512K Macintosh.	90-day warranty. \$5 thereafter. Not copy-protected.	★ ★ ★ ★	★ ★ ★ ★	★ ★ ★ ★	★ ★ ★ ★	A	★ ★ ★ ★
EDUCATION/FUN LEARNING									
AMIGADOS EXPRESS Bantam Software 666 Fifth Ave. New York, NY 10103 (212) 765-6500 \$30 ©1986, 1987	If you hate reading documentation, then you'll like this on-line manual for Amiga DOS. Lists commands and concepts in convenient drop-down menus. A useful learning and reference tool. —SUMMERS	Amiga.	90-day warranty. \$5 thereafter. Not copy-protected.	★ ★ ★ ★	★ ★ ★ ★	★ ★ ★ ★	N/A	E	★ ★ ★ ★
JEOPARDY ShareData, Inc. 7400 W. Detroit St., #C170 Chandler, AZ 85226 (602) 961-7519 \$10 ©1987	An exciting simulation of the TV trivia show: Test your knowledge against the computer or up to two human opponents. Quick thinking is essential. Amusing graphics and sound effects. —ZORNBERG	Reviewed on C 64/128. Also for Apple, IBM PC/PCjr (with CGA or EGA).* Color monitor recommended.	Unlimited warranty (for registered users only). Not copy-protected.	★ ★ ★ ★	★ ★ ★ ★	★ ★ ★ ★	★ ★ ★ ★	A	★ ★ ★ ★
LEARNING TOOL Arborworks, Inc. 1810 Sunrise Ann Arbor, MI 48103 (313) 747-7087 \$50 ©1986	Helps students (high school and up) organize and reorganize class notes. These notes can be used as the basis of a term paper or as a study guide for an exam. Effective and easy to use. —AKER	512K Macintosh.	Sold as is. Not copy-protected.	★ ★ ★ ★	★ ★ ★ ★	★ ★ ★ ★	N/A	A	★ ★ ★ ★
MICROZINE, NO. 17 Scholastic Software 730 Broadway New York, NY 10003 (212) 505-3000 \$40; \$30/issue by subscription ©1986	In the latest Microzine, learn about parts of the body, search a database for facts about 150 animals (both real and imaginary), and exercise problem-solving skills as you try to navigate on another planet. —MORRIS	Apple. Printer optional.	60-day warranty. \$10 for 10 months thereafter.	★ ★ ★ ★	★ ★ ★ ★	★ ★ ★ ★	★ ★ ★ ★	E	★ ★ ★ ★
PRINCIPAL'S ASSISTANT Mindscape, Inc. 3444 Dundee Road Northbrook, IL 60062 (312) 480-7667 \$60 ©1987	This do-it-yourself design program lets you create awards, signs, and notices with a choice of borders and combinations of print styles and pictures. What you see on the screen is what you get on the page. It's not only for principals. —SOLOMON	64K Apple. Color monitor optional.	90-day warranty. \$13 for 9 months thereafter or for backup.	★ ★ ★ ★	★ ★ ★ ★	★ ★ ★ ★	★ ★ ★ ★	E	★ ★ ★ ★
RATINGS KEY O Overall performance; D Documentation; EH Error-handling; GQ Graphics quality; EU Ease of use; V Value for money; ○ Poor; ★ Average; ★★ Good; ★★★ Very Good; ★★★★ Excellent; N/A Not applicable; E Easy; A Average; D Difficult; † Longer review follows chart *Titles listed for the IBM PC/PCjr will also run on many IBM PC compatibles; owing to the proliferation of compatibles, check with the publisher of the program or your dealer for compatibility.									

SOFTWARE GUIDE

EDUCATION/FUN LEARNING

Title Publisher Price	Brief description	Hardware/ Equipment required	Backup policy	Ratings						
				O	D	PS	GQ	EU	V	
TALKING TEACHER Firebird Licensees, Inc. P.O. Box 49 Ramsey, NJ 07446 (201) 444-5700 \$40 ©1986	Uses animation and speech synthesis to help young children practice letter recognition, letter-sound correspondence, and spatial relationships. It's clever, efficient, and lots of fun.† —KOVACS	C 64/128. Color monitor recommended.	90-day warranty.	★	★	★	★	E	★	★

ENTERTAINMENT

Title Publisher Price	Brief description	Hardware/ Equipment required	Backup policy	Ratings						
				O	D	PS	GQ	EU	V	
ACCOLADE'S COMICS Accolade, Inc. 20813 Stevens Creek Blvd. Cupertino, CA 95014 (408) 446-5757 \$40-\$45 ©1987	Ingenious animated comic book tells a spy story graphically in four panels. Players control plot decisions and participate in arcade-style game sequences within the adventure.† —MORGENSTERN	Reviewed on 64K Apple. Also for C 64/128. Joystick optional.	90-day warranty. \$10 thereafter. \$6 for backup.	★	★	★	★	E	★	★
BY FIRE AND SWORD Avalon Hill Game Company 4517 Harford Road Baltimore, MD 21214 (301) 254-9200 \$25 ©1986	As one of six barons battling for supremacy in a tenth century realm of wizards and knights, you must expand your borders at the expense of others. Winners must master the diplomatic approach. —DELSON	IBM PC/PCjr.* CGA.	30-day warranty. \$10 thereafter. Not copy-protected.	★	★	★	★	E	★	★
CHAMPIONSHIP BASEBALL Gamestar/Activision 2350 Bayshore Parkway Mountain View, CA 94043 (415) 960-0410 \$30-\$40 ©1986	The emphasis is on arcade action, with an effective behind-the-plate perspective for hitting and good control of runners. You do make a few managerial decisions, such as drafting a team. —MORGENSTERN	Reviewed on C 64/128. Also for Amiga, Apple, Atari ST, 256K IBM PC.*	90-day warranty. \$7.50 thereafter.	★	★	★	★	A	★	★
EXPRESS RAIDER Data East USA, Inc. 470 Needles Drive San Jose, CA 95112 (408) 286-7074 \$35 ©1986	The old west scenario: You're a good guy out to save the passengers and the train from bandits and "recapture the loot." But there's nothing new in this arcade game's sound and graphics. —DELSON	C 64/128. Joystick.	90-day warranty.	★	★	★	★	E	★	★
KILLED UNTIL DEAD Accolade (see above for address and phone) \$30 ©1986	This is murder with a comically light touch—a series of 21 short mysteries with cartoon animation, lots of puns, and lively graphics. Appealing entertainment. —MORGENSTERN	C 64/128. Joystick.	90-day warranty. \$10 thereafter or for backup.	★	★	★	★	A	★	★
MAC PRO FOOTBALL Avalon Hill Game Company (see above for address and phone) \$50 ©1986	A wealth of details (including over a billion possible play combinations) make for a breathtakingly exciting football simulation. Gamers choose from dozens of Super Bowl teams. —DELSON	512K Macintosh.	30-day warranty. \$10 thereafter or for backup.	★	★	★	★	A	★	★
PHANTASIE III Strategic Simulations, Inc. 1046 N. Rengstorff Ave. Mountain View, CA 94043 (415) 964-1353 \$40 ©1987	The second sequel in this wonderful role-playing adventure series offers several added attractions, including social classes, new weapons (bows), realistic injuries, and superb dungeons. —DELSON	Reviewed on Apple IIe/IIc/IIgs. Also for Atari ST, C 64/128.	30-day warranty. \$12 for backup.	★	★	★	★	A	★	★
REALMS OF DARKNESS Strategic Simulations, Inc. (see above for address and phone) \$40 ©1987	Looking for a role-playing adventure with more elements than even the <i>Phantasie</i> , <i>Ultima</i> , or <i>Wizardry</i> games? You'll find some sophisticated extras here.† —DELSON	Reviewed on Apple IIe/IIc/IIgs. Also for C 64/128.	30-day warranty. \$12 for backup.	★	★	★	★	A	★	★

RATINGS KEY O Overall performance; D Documentation; PS Play system; GQ Graphics quality; EU Ease of use; V Value for money; ○ Poor; ★ Average; ★★ Good; ★★★ Very Good; ★★★ Excellent; N/A Not applicable; E Easy; A Average; D Difficult; † Longer review follows chart

*Titles listed for the IBM PC/PCjr will also run on many IBM PC compatibles; owing to the proliferation of compatibles, check with the publisher of the program or your dealer for compatibility.

SOFTWARE REVIEWS

On the following pages, you'll find in-depth reviews of some of the programs listed in the Software Guide. Refer back to the Guide on page 64 for information such as backup policies and addresses of software publishers.

EDUCATION/ FUN LEARNING

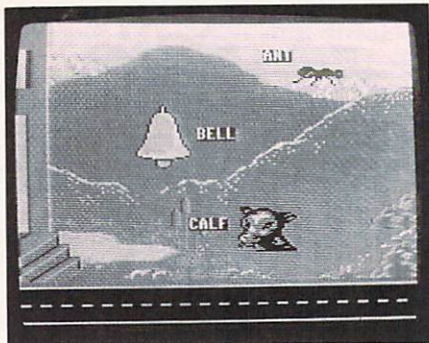
Talking Teacher

HARDWARE REQUIREMENTS: C 64/128.
PUBLISHER: Firebird Licensees Inc.
PRICE: \$40
PUBLISHER'S SUGGESTED AGES: 2-8

A talking computer program can be an invaluable aid when teaching young children (or children with special needs) letter recognition and letter/sound correspondence—two prime aspects of beginning to read. The simple, clearly organized elements of *Talking Teacher* make it a very helpful assistant for any child grappling with these concepts.

Talking Teacher offers three levels of complexity. At Level One, a child types a letter on the keyboard. The computer then prints the letter on the screen, while a satisfyingly intelligible voice speaks the letter's name aloud.

At Level Two, the program displays a letter on the screen and asks the child to locate the letter on the keyboard. If the child presses the wrong key, the computer's voice patiently offers guidance, by saying, for exam-



ple, "try a little lower," or "try to the left" (although it is unlikely that a youngster who can't locate letters correctly on a keyboard would be able to respond to directional orientations of this type). A child who presses the correct letter key is rewarded by seeing an animated

graphic of an object whose name begins with that letter.

At Level Three, the computer displays an animated graphic and speaks the name of the object pictured, asking children to locate the first letter of that object's name. The program moves a little slowly at this point, and a child who has mastered Levels One and Two might find this level a little boring.

But overall, *Talking Teacher* is an effective program. It also loads very quickly, which helps with impatient children. Nicely designed print materials (and crayons!) complete this simple, but satisfying package.

—DEBORAH KOVACS

HOME BUSINESS & PRODUCTIVITY

InLine

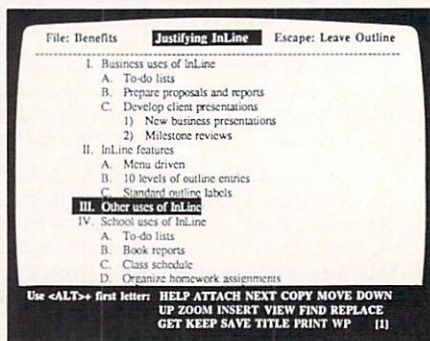
HARDWARE REQUIREMENTS: 256K IBM PC.
PUBLISHER: Compusense
PRICE: \$50

With *InLine*, that durable favorite of high-school teachers everywhere, the Harvard outline, makes the jump from blue-lined, three-hole-punch paper to computer screen. A Harvard outline (for those of you who dozed off during ninth grade) is a system for organizing thoughts and ideas. Major points begin with a roman numeral; secondary points are preceded with a capital letter and indented; the next level of subideas is preceded with an arabic numeral and indented still further, and so on. Unlike other available computer outlining programs, *InLine* sticks with this standard system, automatically supplying the proper number or letter.

Creating an outline is a dynamic process—you make an entry, change your mind, decide to move an idea to a different section, and on and on. *InLine* makes most changes simple enough, particularly when it comes to moving or copying information from one section to another. The letters and numbers of subheadings are automatically adjusted to reflect any changes made. You can also attach a block of text to any head or subhead in your outline, though you are limited to 700 characters (a fact overlooked in the otherwise excellent user manual).

On the other hand, the program is

less flexible than others (notably *ThinkTank* and *Ready!*) in its ability to expand or hide the levels of an outline. Any good computer outliner allows you to choose how many levels of subheads will appear on-screen. You might, for instance, want to view only your major roman-numeral headings to see the overall organization of the outline, then



zoom out a level to see the first level of subheadings, and so on. In other outlining programs, you can display the subheads for only a single heading if you like; *InLine* expands all the subheads or none at all.

The printout capabilities are fine, but the main feature here (and a major advantage over *InLine*'s competition) is the ability to save an outline in the file format of several popular word processors. If you use *WordPerfect*, *MultiMate*, *WordStar*, or *Microsoft Word*, *InLine* will create an outline file that will load perfectly, complete with proper formatting, ready to be edited further or included directly in a word-processed document. Outlines can also be saved as straight ASCII files, which most other word processors will accept.

Considering the relatively low price and the unusual ease of transferring files to your word processor, *InLine* is an especially good choice for anyone who wants to bring organization to written material before creating a final draft or who wants to include an outline in a larger document.

—STEVE MORGENSTERN

RapidFile

HARDWARE REQUIREMENTS: 256K IBM PC.
PUBLISHER: Ashton-Tate
PRICE: \$395

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SOFTWARE REVIEWS

File—a superb file manager and word processor that can help with almost any business task imaginable. Whether you're immersed in mailing lists and labels, inventory control, accounts receivable and payable, report writing, form letters, or other database endeavors, *RapidFile* is one tool to consider. Is it hard to



use? Not really—there are four manuals (including an easy one for beginners, a reference guide for the more experienced user, and a "quick reference guide" for the expert), a disk-based tutorial, and context-sensitive on-screen help.

How much information will *RapidFile* handle? If your disk drive is willing, you can store a 10-megabyte file containing as many as 64,000 records. Within a file, each record can contain up to 7,500 characters in as many as 250 fields. If the text in a field exceeds 254 characters (perhaps notes on telephone conversations or detailed information about a customer's preferences), no need to worry—*RapidFile* will create a special memo for that field and let you store up to 64,000 characters (that's more than 100 single-spaced pages).

What can you do with all this information? Just about everything (and if you do it often enough, you can automate the procedures with keyboard macros that string together multiple keystrokes). For starters, you can create new data using four-function arithmetic operations or extraordinarily complex expressions (for example, you could figure out the total value of an inventory by multiplying one field—unit cost—by the quantity-on-hand field). You can merge data files to create a single, large file. You can sort data on as many as 15 fields (in either ascending or descending order); you can also search for and display or tag records using data in as

many as seven fields. You can display some or all of the fields using any of hundreds of custom-made layouts. You can display data in tabular format (rows and columns) or one record at a time; in fact, you can even do both at once on the same screen. You can print quick reports of subtotals and other summary data, or full-fledged reports covering part or all of any database.

RapidFile also includes a word processor with standard functions, such as moving and copying, finding and replacing, full control over text (margins, positioning, and type style), and 80-column headers and footers with automatic pagination. Printer codes can be embedded in the text for even more precise control over your particular printer. You can insert text from other files and mail merge form letters using names and addresses from the database (you can even preview and personalize each letter before printing).

RapidFile is a fine stand-alone program that probably will meet all of your business needs. However, it also imports and exports files from other packages, such as Lotus 1-2-3, *pfs:File*, *dBASE II* and *III*, *Friday!*, *Framework II*, and ASCII text. For a really high-powered combination, you can use *RapidFile* together with one or more of these other packages. For example, if you're a Lotus 1-2-3 fan, you can use 1-2-3 to create your worksheet, to perform calculations, and to print graphs; then transfer the data file to *RapidFile* to quickly select and display subsets of data, to carry out complex sorting, to mark subsets of records for display or manipulation, to print reports, to write memos, and to create form letters and mailing labels using information in the data file. *RapidFile* is strong software. —TONY MORRIS

SuperPaint

HARDWARE REQUIREMENTS: 512K Macintosh.

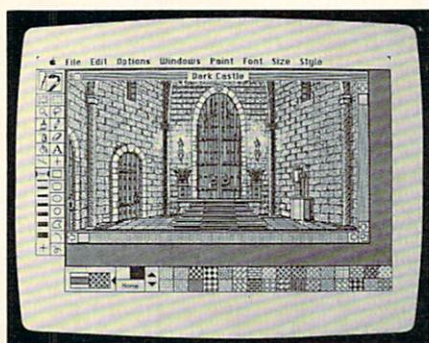
PUBLISHER: Silicon Beach Software
PRICE: \$99

SuperPaint's name says it all: It's a super extension of the classic *MacPaint* program. Where *MacPaint* was limited to pixel (also called bit-mapped) graphics, *SuperPaint* combines pixel- and object-oriented graphics. In pixel graphics you manipulate individual dots, but in object-oriented graphics you manipulate

late objects as a whole. For instance, this allows you to move objects behind or in front of each other, even after they've been placed on the screen.

To reflect the added layer of drawing, the tool palette has two layers of tools. In the paint layer, the palette is similar to MacPaint's. SuperPaint offers a refined FatBits, called the Magnifier tool, that lets you zoom in 2x, 4x, and 8x. These additional magnifications make smoothing out a rough drawing easy. The publisher has also added Stretch, Distort, Free Rotation, and Perspective commands to SuperPaint. With Stretch, Distort, and Perspective, you can alter the size and proportion of a graphic. Free Rotation allows you to rotate a graphic at any angle.

SuperPaint boasts a pattern palette with three sets of patterns to choose from. One of the sets has gray tones that look particularly good when printed on the Laser-



Writer. There is also an empty palette to which you can add your own patterns and a color palette for use with the ImageWriter II.

The draw layer in SuperPaint is functionally the same as the one in MacDraw. With it, you can draw objects and group them together. The MacDraw item that it lacks (and that I miss the most) is a Set Drawing Size command that allows you to create a drawing of any size. Sadly, SuperPaint is limited to the standard page sizes. Without the Set Drawing Size command, SuperPaint is not really equivalent to MacDraw, but having bit-mapped and object-oriented graphics together in the same program makes up for the deficiency.

SuperPaint lets you work on an object at 300 dots-per-inch resolution (the LaserWriter's maximum resolution) in LaserBits. You can select a portion of the Paint layer with

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CIRCLE READER SERVICE 16

SEPTEMBER 1987 71

SOFTWARE REVIEWS

the Selection Rectangle tool; and when you open the LaserBits window, your selection appears four times as large as it was originally. Then you can use the Magnifier tool for an even closer view.

Like *MacPaint*, *SuperPaint* is a tool that anyone can understand and use successfully. The manual is clear and to the point. It contains a good tutorial that introduces you to its features. *SuperPaint* can be put to a wide range of uses, from school assignments to business projects. It's easy enough to use for just having fun and full-featured enough to handle work-related artwork, such as fliers and brochures.

—FRED TERRY

ENTERTAINMENT

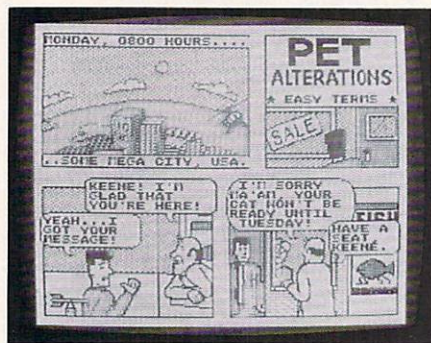
Accolade's Comics

HARDWARE REQUIREMENTS: 64K Apple, C 64/128.

PUBLISHER: Accolade, Inc.

PRICE: \$40–\$45

Put a comic book on a computer screen, add animation and arcade-style game sequences, and let players put words in the characters' mouths to determine the story's progression—and you have *Accolade's Comics*. While I can summarize the game in a sentence, it takes hours and hours to work your way through the twisted plot possibilities, not to



mention conquering the game-within-a-game action sequences. It's time well spent, however, since this is the most original gaming concept I've seen in a long time.

To tell the story of Steve Keene, spy extraordinaire, the designers have created a comic-book effect by splitting the screen into four panels, which appear one at a time as you progress through the story using keyboard or joystick. Each quarter-

screen panel has some interesting animation: mouths move, hands point, a helicopter flies by, and characters are socked in the jaw and fall out of the frame. Some of these effects are truly ingenious—my favorite has a movie screen within the frame, and the screen blinks as if a real projector were throwing the image.

All the dialogue is presented in traditional comic-strip voice balloons. Some of these balloons offer a choice of dialogue—and that's where the player's control comes in. By picking one of the three or four available choices, you determine what will happen next in the story.

From time to time, our intrepid hero falls into some dastardly trap, and it's up to you to get him out by running, jumping, dodging, or tossing grenades. There are actually eight arcade-style games tucked into the story at different points; and while none of them is a work of genius, they're all fun and often pose significant challenges. Players have the option of practicing any of these minigames before starting their adventure, and it isn't a bad idea. Another good idea is saving your position frequently, so you don't have to start over from the beginning just because you were eaten by a shark (don't you hate when that happens?).

My only complaint about *Accolade's Comics* is the lack of brainpower involved in making choices. There is no logical reason to make one dialogue decision over another; it's just a trial-and-error process. I look forward to seeing another attempt, using the same play system but with clues to be sorted out, puzzles to be solved, and a plot that challenges the mind as well as the joystick muscles. This is not meant to belittle the achievement of this first effort, though. The creativity and ingenuity lavished on this program paid off in high entertainment levels for young and old in our house.

—STEVE MORGENSTERN

Realms of Darkness

HARDWARE REQUIREMENTS: Apple IIe/IIc/IIgs, C 64/128.

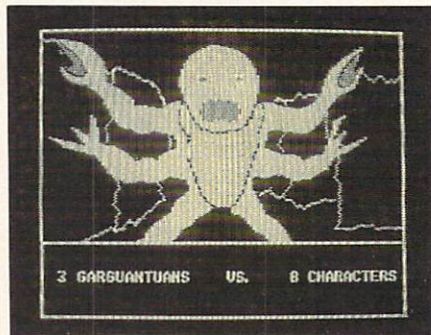
PUBLISHER: Strategic Simulations, Inc.

PRICE: \$40

For those seeking a more complex role-playing adventure (RPA) than

the *Phantasie*, *Ultima*, or *Wizardry* series of games, here's an advanced adventure which makes more demands on players, but offers greater rewards in return.

The goal in *Realms of Darkness* is to complete seven different tasks, each linked to a central story line.



The tasks are increasingly difficult, and require problem-solving abilities as well as strong swords and potent spell casters.

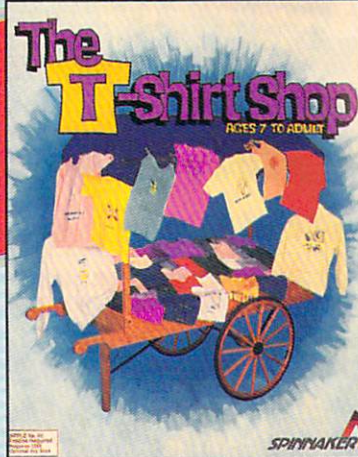
Like the better-known adventures, this RPA offers players the chance to create characters, equip them, take them into combat, and watch them develop as the game progresses. But there's more here for the RPA fan: a highly sophisticated combat system; the chance to "talk" with creatures you encounter in the game (a feature also found in *Ultima IV*); the ability to type in commands for your characters such as "look at the ring" (normally found only in text and text/graphic adventures); the need to constantly map your environs (no longer a common occurrence in RPAs); the ability to split your party when entering dungeons and send them to do different tasks; and an on-off switch which allows advanced players to "turn off" the on-screen command menu—giving a great feeling of involvement in the game.

All these elements combine to create an excellent quest for solitaire or team play. Old hands will appreciate the added complexity the game has to offer, while newcomers will simply take what comes and deal with it accordingly.

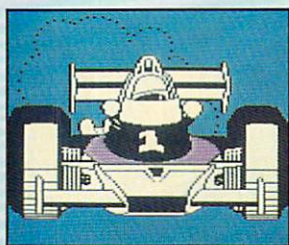
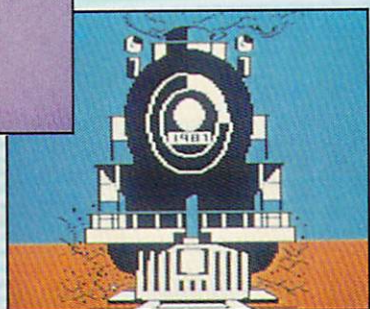
Play testers agreed that *Realms of Darkness* compared favorably with last year's *Wizard's Crown* (which still remains our all-time favorite in the genre) and equalled such excellent examples as *Wizardry III*, *Ultima III* and *IV*, and *Phantasie II* and *III*. It is recommended for players of all ability levels.

—JAMES DELSON

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The first thing to do is to boot up T-Shirt Shop. You'll be greeted by an easy to understand menu that lets you see everything the program can do at a glance. You can LOAD pictures from the picture disk, DRAW your own pictures, TYPE in any slogan you can think of, and COLOR in your pictures.

2

Choose a Graphic

Now choose LOAD from the menu. You can choose from more than 50 supplied graphics. Hollywood celebrities, political and historical figures as well as plants and animals represent some of the categories included. For a change, you can draw your own picture. In either case, once you choose a picture, the outline will appear on the screen, ready to be colored.

3

Paint It

Here's your chance to show your artistic ability. Using the palette of colors, the brushes and the sprayscans, you can paint a rainbow of color—you can even color in the picture to match your eyes! If you want, the program will automatically paint the picture with colors you choose.

4

Add Type

You've got a beautifully colored picture now. Go to the TYPE section, and choose from a variety of type styles. Name your picture, or attach some absurd sayings. Create catchy political slogans, humorous sayings, or something incredibly tacky.

5

Print It

Print your shirt design onto the special iron-on transfer paper (free sheets are included). With T-Shirt Shop, what you see on the screen is exactly what you'll get on your t-shirt. The paper will work with any ribbon—even in color—and will transfer perfectly to any t-shirt. Print your design, iron the transfer onto your shirt and you're in business. Impress your friends! Wear them into the office, to the beach, or to a wedding. T-shirts make great gifts, too!

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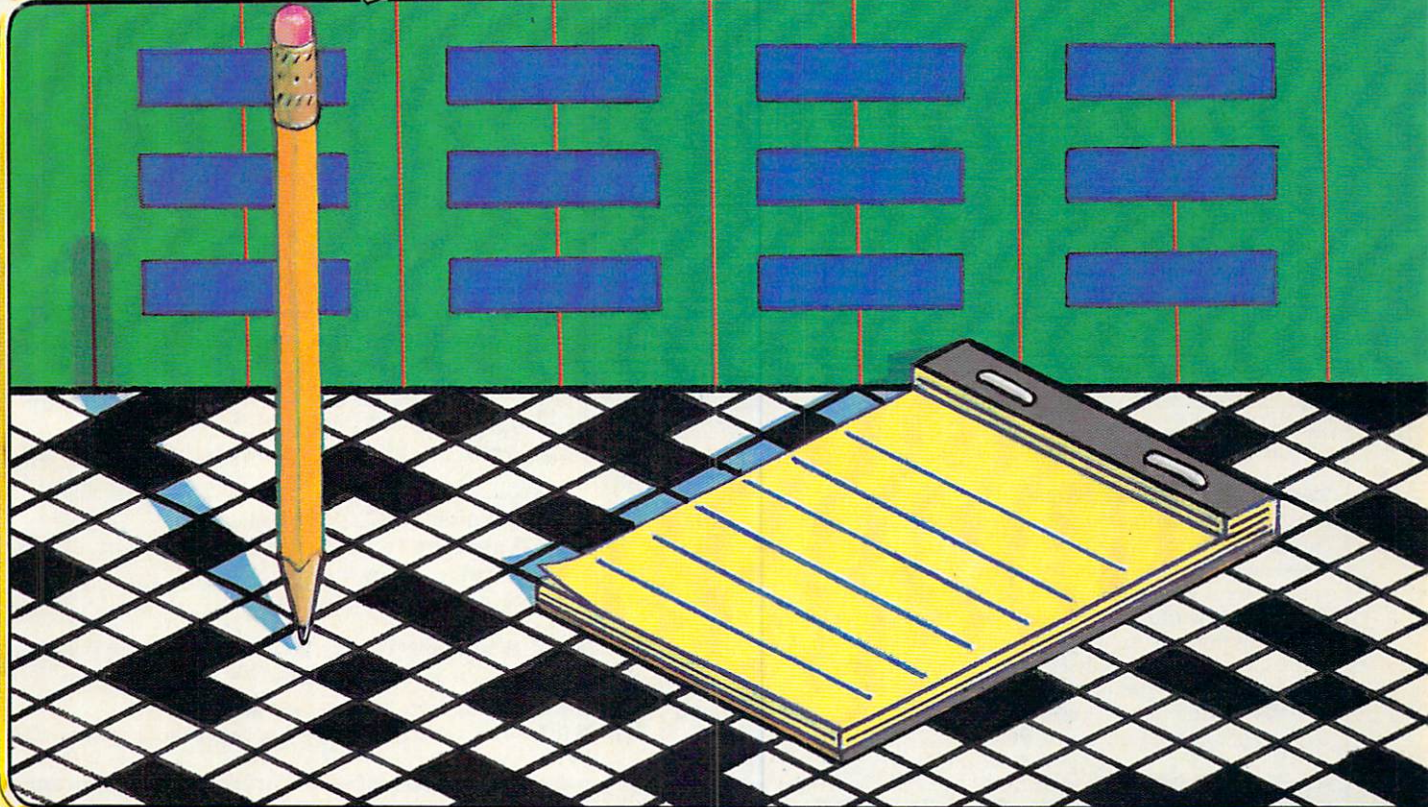


ILLUSTRATION BY BARTON STABLER



S E P T E M B E R



FYI

Page 76

Information about our programs, program coverage and "Programming P.S." PLUS: The solution to last month's puzzle.

GRAPHICS PROGRAM

Page 77

The keyboard is your control panel for creating *Fun Graphics* images.

FUN LEARNING PROGRAM

Page 82

Play *Memory Madness* to sharpen memory skills and learn about our Constitution.

PUZZLE

Page 89

Clues and data for a back-to-school Crossword Puzzler.

MICROTONES

Page 89

Be-bop-ba-doo-bop, Raz-Ma-Jazz!

TIPS TO THE TYPIST

Page 91

How to type in *FAMILY COMPUTING* programs.

ILLUSTRATION BY JAMES CHERRY III

Cherry

THIS MONTH'S PROGRAM COVERAGE

Computers†	Fun Graphics (pg 77)	Memory Madness (pg 82)	Puzzle Clues (pg 89)	Raz-Ma-Jazz (pg 89)
Adam	★		★	
Apple IIcs	★	★	★	
Apple II series	★	★	★	
Atari 800/XL/XE	★ G		★	★
Commodore 64/128		★	★	★
Commodore 128 only	★			
IBM PC FAMILY				
IBM PC	★ C	★	★	
IBM PCjr	★ C	★	★	★ T
IBM PS/2 Model 30	★ C	★	★	
IBM PC COMPATIBLES				
Amstrad PC1512DD	★ C	★	★	
Blue Chip	★ C	★	★	
Commodore PC-10	★ C	★	★	
Epson Equity I	★ C	★	★	
Kaypro PC-10	★ C	★	★	
Leading Edge Model D	★ C	★	★	
Panasonic FX-600	★ C	★	★	
Tandy 1000/EX/SX	★ C	★	★	★ P T
Vendex Turbo 888-XT	★ C	★	★	
Zenith Z148PC	★ C	★	★	
Macintosh			★	★
Tandy Color Computer	★		★	
TI-99/4A				★

KEY ★ Program in this issue for this computer, C Color monitor required, G GTIA chip required, P Patch required (see Tandy "Machine Specifics" in this issue), T Television or monitor with speaker required, † see below for specific models.

THE SYSTEMS WE TEST ON

Every FAMILY COMPUTING program is thoroughly tested before publication. The exact systems we use during the testing process are listed here. While you can be sure that a program will work if your system matches ours, a comparable system configuration should also work. For example, even though we do not test on the Franklin Ace, Apple programs should work on this system. Any exception to the following hardware/software configurations will be listed in the chart above. Systems that do not have a specific printer listed were tested with Epson FX-80 printers when a printer option was available.

Adam w/80K RAM, Coleco SmartBASIC V1.0, disk enhanced by MMSG, Coleco disk drive, AdamDOS, and color monitor. **Apple IIe** in 40-column mode w/64K RAM, DOS 3.3, two disk drives, MPC parallel printer interface, monochrome and color monitor. Apple programs should also work on Apple IIc/II Plus. **Apple IIcs** w/1MB RAM, one 3.5-inch and one 5.25-inch disk drive, ProDOS 3.3, and Apple RGB monitor. **Atari 800XL** w/two disk drives, DOS II version 2.05, Atari 850 interface, and color monitor. Atari programs should also work on Atari 800 (w/48K), 1200XL, 65/130XE. Smaller programs should work on Atari 400 & 600XL. **Commodore 128** in C-64 mode with two 1571 disk drives, color monitor, and Micrografix parallel graphics interface. Programs should also work on Commodore 64/64C/128D. **IBM PC** w/640K RAM, Disk BASIC D2.00, IBM Monochrome Display and Printer Adapter, monochrome monitor, IBM Color/Graphics Monitor Adapter, RGB monitor, AST Sixpack Plus, and IBM PC DOS 3.10. **IBM PCjr** w/128K RAM, one disk drive, IBM PC DOS 2.10, cartridge BASIC J1.00. **IBM PS/2 Model 30** w/640K RAM, one floppy and one hard-disk drive, RGB monitor, IBM PC DOS 3.30, and IBM PC BASIC A3.30. **Macintosh** w/512K RAM, two disk drives, Microsoft BASIC 2.1, and ImageWriter printer. Macintosh programs should also work on 128K Mac/Mac Plus/SE/II, and under Microsoft BASIC 2.0. **Tandy Color Computer 2** w/64K RAM, Disk Extended Color BASIC 1.1, two disk drives, Botek serial-to-parallel printer interface, color monitor. Programs should also work on Color Computer 1 (w/64K) and 3. **TI-99/4A** w/8K RAM, peripheral expansion system, disk drive, RS232 Interface Card, and TI-99/4 Printer.

The following PC compatibles have been added to our testing list. IBM PC programs should also work on other PC compatibles with at least 128K.

Amstrad w/640K RAM, two disk drives, MS-DOS 3.20, Locomotive BASIC, RGB monitor. **Blue Chip** w/512K RAM, two disk drives, monochrome monitor, MS-DOS 3.20, GW-BASIC 3.20. **Commodore PC-10** w/640K RAM, two disk drives, monochrome monitor, MS-DOS 3.20, GW-BASIC

3.20. **Epson Equity I** w/256K RAM, two disk drives, monochrome display adapter, monochrome monitor, MS-DOS 3.10, GW-BASIC 3.10. **Kaypro PC 10** w/640K RAM, two disk drives, RGB monitor, MS-DOS 2.11, GW-BASIC 2.02. **Leading Edge Model D** w/640K RAM, two disk drives, monochrome and RGB monitors, MS-DOS 3.10, GW-BASIC 3.11. **Panasonic FX-600** w/640K RAM, two disk drives, MS-DOS 3.10, GW-BASIC 3.10, enhanced graphics adapter, RGB monitor. **Tandy 1000** w/256K RAM, two disk drives, MS-DOS 2.11 version 02.11.22, GW-BASIC 2.02 version 01.01.00, RGB monitor. **Tandy 1000 EX** w/256K RAM, two disk drives, MS-DOS 2.11 version 02.11.24, GW-BASIC 2.02 version 01.02.00, RGB monitor. **Tandy 1000 SX** w/384K RAM, two disk drives, MS-DOS 3.20 version 03.20.00, GW-BASIC 3.20 version 03.20.00, RGB monitor. **Vendex Turbo 888-XT** w/640K RAM, two disk drives, MS-DOS 3.20, GW-BASIC 3.20, RGB monitor. **Zenith Z148PC** w/640K RAM, two disk drives, MS-DOS 3.10, GW-BASIC 3.20, RGB monitor.

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A HELP LINE FOR PROGRAM PROBLEMS

Call our Program Status Line any time of day or night to receive an up-to-date summary of our latest programs, the machines on which they run, and any corrections or enhancements to the programs.

PROGRAMMING P.S.

Corrections to Previous Months' Programs

Crossword Puzzler (July 1987, page 69)

Commodore 64 & 128 (C-64 mode): The program gives an error message if you hit RETURN instead of typing a file name to save under when in menu option 3 (Create a puzzle using FC DATA). To correct the error, change line 1410 to read as follows:

```
1410 GOSUB 7000:IF F$="" THEN DL=100:GOSUB 3000:GOTO 1410
```

Crisscross (August 1987, page 61)

Apple II series: To correct scoring problem, change line 560 to read as follows:

```
560 IF SC <= PS THEN PRINT:GOTO 610
```

IBM PC & compatibles: To correct scoring problem, change lines 220 and 260 to read as follows:

```
220 H1=C0:H2=R0:S=10:SC=0:FL=0:PS=HS
260 PRINT "Use the cursor keys to move your player.";
```

Tandy Color Computer: In order for the program to run correctly, change line 230 to read as follows:

```
230 PRINT@65,TB$;:PRINT@417,TB$;
```

SOLUTION TO LAST MONTH'S PUZZLE

S	H	E	E	T	H	O	M	E	F	O	N	T
T	E	L	E		C	A	P	O		L	I	N
E	X	I	L	E		S	U	D	D	E	N	E
V	A	S		R	A		S	E	C	T	O	R
E		F		C	S					E	B	B
S	I	L	I	C	O	N			V	A	L	L
	C	O		P	R	I	N	T		L	E	A
L	O	T		U	N	D	O		A	E	T	T
I	N	U	N		E	V	I	L		R	I	O
S		S	E			E	S	T		O	W	N
T	C			K	O	A	L	A		S	N	Y
S	L	Y		I	B	M		S	E	P	T	I
	O	E		C	O	D	E		P	A	R	I
A	N	N		K	E	Y		B	A	S	I	C
T	E	S	T							M	O	U
												S

KOLORFUL KEYS

Create Colorful Patterns with this Hi-Res Graphics Program

BY JOEY LATIMER

I still remember how excited I was on that day back in 1979 when I walked into the first computer store in my neighborhood. The showroom was almost bare, except for a few calculators, an Ohio Scientific computer system, and a popular video game system. But, in an alcove in the middle of the store, something caught my eye that I will never forget. It was there that a teenage boy was rapidly pressing the keys of an Apple II computer, while the video monitor produced the most amazing display of color graphics I had ever seen. "This is incredible!" I mumbled, as the screen burst into spiraling star-burst patterns. "What do you call that?"

"Oh, those are high-resolution graphics," he replied matter-of-factly. "It's easy. Just press this key to rotate and this one to change colors." I tried it and, sure enough, it was easy.

"How does it do that?" I asked.

"It's all in the program I wrote," he replied as he listed the program (which looked like Greek to me).

The next thing I remember about that day in 1979 is the store clerk trying to get me to leave so he could close for the night.

Back to 1987: It's two in the morning on a Tuesday, and what do you suppose I did all day long? I came to the office to finish the inventory, but I never got started. I sat down at the computer and started doodling with some graphics commands, then I doodled some more, and pretty soon I found myself saying, "This is incredible!" It's a new program!



After a few more days of not finishing the inventory, I sent the program to my pals at the FAMILY COMPUTING lab in New York. They played with it, edited it, and Pasquale Cirullo, a technical editor, called me back and said, "We want to put it in. What do you want to call it?"

"Fun Graphics," I said as my eyes transcended the two-dimensionality of the screen. And here it is, folks . . . a fun, high-resolution graphics program, with its roots dating back to my first visit to that computer store in 1979.

USING FUN GRAPHICS

Fun Graphics lets you make colorful, futuristic graphic designs by pressing different keys. You can take your time, and pause while you ponder your next step, or you can improvise animated graphics "on the fly"—or watch the computer randomly create its own patterns.

Central to *Fun Graphics* are eight preprogrammed high-resolution graphic patterns activated by pressing keys one through eight or P if you want the computer to pick the pat-

tern. The key assignments for these patterns are as follows:

Key

- 1 Rays emanating from the center of the screen
- 2 Frames drawn from the outer edge of the screen toward the center
- 3 Rays starting at both sides of the screen drawn toward the center
- 4 Vertical bars moving across the screen from right to left
- 5 Peacock feathers spreading out across the top of the screen
- 6 Solid frames filling the center of the screen, then moving toward the edges
- 7 Horizontal bars running from top to bottom
- 8 Diagonal lines going from lower left to upper right

COLORING YOUR FUN GRAPHICS

When *Fun Graphics* starts, it randomly picks a set of colors to cycle

through. You can pick specific colors by pressing letter keys, or you can press R if you want to go back to random colors. Some computers will display as many as sixteen colors, while others display as few as four. See the chart below for the color and command keys that your computer has available for use in the *Fun Graphics* program.

GUEST LEFTOVERS

When you decide that you like what you see on the screen, you can "pause" the program by pressing the space bar. When you press the space bar again, the program will continue where it left off. If, instead, the screen has become too cluttered, you can clear it by pressing the RETURN or ENTER key. (NOTE: You can also change colors or patterns while the screen is paused or after it has been cleared.)

KEYS USED IN FUN GRAPHICS

ACTION	PC & COMPATIBLES				TANDY COLOR COMPUTER	
	ADAM	APPLE	ATARI	C 128	IBLES	COMPUTER
Change pattern	1-8	1-8	1-8	1-8	1-8	1-8
Change luminance	—	—	9,0	—	—	—
Change palette	—	—	—	—	9	9
Change color	A-O	A-F	A-O	A-O	A-C	A-D
Random pattern	P	P	P	P	P	P
Random color	R	R	R	R	R	R
Pause drawing	SPACE	SPACE	SPACE	SPACE	SPACE	SPACE
Clear screen	RETURN	RETURN	RETURN	RETURN	ENTER	ENTER

SPECIAL INSTRUCTIONS FOR CERTAIN MACHINES

Adam & Apple

The Adam and Apple versions of *Fun Graphics* use a high-resolution graphics screen that cannot display text. If you made an error while typing the program, the computer will appear to freeze. If this happens to you, press CTRL-C and RETURN to stop the program and then type TEXT and press RETURN to return to the text screen.

Atari 800/XL/XE

The Atari 800/XL/XE series of computers allow you to pick the luminance, or brightness, of colors. Press 9 to lower, or 0 to raise, the luminance.

IBM PC & compatibles & Tandy Color Computer

The IBM PC & compatibles and the Tandy Color Computer allow you to choose between two palettes, or groups of colors, when drawing on the graphics screen. To switch back and forth between palettes, press 9.

GRAPHICS PROGRAM

Adam/Fun Graphics

```

10 LOMEM: 29000:HGR2:cf = 0:f = 0:np = 1:st = 0
20 mf = INT(RND(1)*15)+1:sc = INT(RND(1)*15)+1
30 m = INT(RND(1)*8)+1
40 FOR x = 28000 TO 28005:READ y:POKE x,y:NEXT x
50 CALL 28000
60 k = PEEK(64885):IF k = 0 THEN 140
70 CALL 28000:k = k-32*(k > 96)*(k < 123)
80 IF k > 48 AND k < 57 THEN np = 1:m = k-48:st = 0:GO
TO 140
90 IF k > 64 AND k < 80 THEN cf = 1:sc = k-64:(k = 68)
:HCOLOR= sc:GOTO 190
100 IF k = 13 THEN st = 1:HGR2:GOTO 60
110 IF k = 80 THEN np = 1:m = INT(RND(1)*8)+1:GOTO 140
120 IF k = 82 THEN cf = 0:sc = INT(RND(1)*15)+1:mf = I
NT(RND(1)*15)+1:f = 0:GOTO 160
130 IF k = 32 THEN st = NOT st:IF st THEN 60
140 IF cf THEN 190
150 IF sc+f > 15 THEN HCOLOR= sc+f-15:GOTO 180
160 IF (sc+f = 0) OR (sc+f = 4) THEN sc = sc+1
170 HCOLOR= sc+f
180 f = f+1:IF f = mf THEN f = 0
190 IF st THEN 60
200 IF NOT np THEN ON m GOTO 220,250,300,340,390,420,4
80,520
210 np = 0:ON m GOTO 220,240,300,330,380,410,470,510
219 REM --CENTER RAYS--
220 a = INT(RND(1)*255):b = INT(RND(1)*191)
230 HPLLOT 140,96 TO a,b:GOTO 60
239 REM --STEP FRAMES--
240 a = 0:b = 191:c = 254:d = 0
250 HPLLOT d,a TO c,a TO c,b TO d,b TO d,a
260 HPLLOT c+1,a TO c+1,b:HPLLOT d+1,b TO d+1,a
270 a = a+3:b = b-3:c = c-3:d = d+3
280 IF a > 92 THEN a = 0:b = 191:c = 254:d = 0
290 GOTO 60
299 REM --SIDE RAYS--
300 HPLLOT 0,96 TO INT(RND(1)*255),INT(RND(1)*191)
310 HPLLOT 255,96 TO INT(RND(1)*255),INT(RND(1)*191)
320 GOTO 60
329 REM --VERTICAL BARS--
330 a = 253
340 HPLLOT a,0 TO a,191:HPLLOT a+1,0 TO a+1,191
350 HPLLOT a+2,0 TO a+2,191
360 a = a-12:IF a < 10 THEN a = 253
370 GOTO 60
379 REM --PEACOCK FEATHERS--
380 a = 70
390 IF a > 210 THEN a = 70
400 HPLLOT 140,191 TO a,0:a = a+3:GOTO 60
409 REM --SOLID FRAMES--
410 a = 0:b = 210:c = 191:d = 70
420 HPLLOT d,a TO d,c TO b,c TO b,a TO d,a
430 HPLLOT d+1,a TO d+1,c:HPLLOT b+1,c TO b+1,a
440 a = a+1:b = b-1:c = c-1:d = d+1
450 IF b < 40 THEN a = 0:b = 210:c = 191:d = 70
460 GOTO 60
469 REM --HORIZONTAL BARS--
470 a = 0
480 HPLLOT 0,a TO 255,a:HPLLOT 0,a+1 TO 255,a+1:a = a+8
490 IF a > 185 THEN a = 0
500 GOTO 60
509 REM --DIAGONALS--
510 a = 0:b = 181:c = 10:d = 191
520 HPLLOT a,b TO c,d:b = b-5:c = c+5
530 IF b < 0 THEN b = 0:a = a+4
540 IF c > 255 THEN c = 255:d = d-4
550 IF d < 0 THEN a = 0:b = 181:c = 10:d = 191
560 GOTO 60
1000 DATA 62,0,50,117,253,201

```

Apple II series/Fun Graphics

```

10 HGR2:CF = 0:F = 0:NP = 1:ST = 0
20 MF = INT(RND(1)*6)+1:SC = INT(RND(1)*6)+1
30 M = INT(RND(1)*8)+1
40 IF PEEK(-16384) < 128 THEN 120
50 GET K$:K = ASC(K$):K = (K-32*(K > 96))*(K < 123))
60 IF K > 48 AND K < 57 THEN NP = 1:M = K-48:ST = 0:GO
TO 120
70 IF K > 64 AND K < 71 THEN CF = 1:SC = K-64:SC = SC+
(SC = 4)+(SC = 6)+(SC = 5):HCOLOR= SC:GOTO 170
80 IF K = 13 THEN ST = 1:HGR2:GOTO 50
90 IF K = 80 THEN NP = 1:M = INT(RND(1)*8)+1:GOTO 120
100 IF K = 82 THEN CF = 0:SC = INT(RND(1)*6)+1:MF = IN
T(RND(1)*6)+1:F = 0:GOTO 140
110 IF K = 32 THEN ST = NOT ST:IF ST THEN 50
120 IF CF THEN 170
130 IF SC+F > 7 THEN HCOLOR= SC+F-7:GOTO 160
140 IF (SC+F = 0) OR (SC+F = 4) THEN SC = SC+1
150 HCOLOR= SC+F
160 F = F+1:IF F = MF THEN F = 0
170 IF ST THEN 50
180 IF NOT NP THEN ON M GOTO 200,230,280,320,370,400,4
60,500
190 NP = 0:ON M GOTO 200,220,280,310,360,390,450,490
199 REM --CENTER RAYS--
200 A = INT(RND(1)*279):B = INT(RND(1)*191)
210 HPLLOT 140,96 TO A,B:GOTO 40
219 REM --STEP FRAMES--
220 A = 0:B = 191:C = 278:D = 0
230 HPLLOT D,A TO C,A TO C,B TO D,B TO D,A
240 HPLLOT C+1,A TO C+1,B:HPLLOT D+1,B TO D+1,A
250 A = A+3:B = B-3:C = C-3:D = D+3
260 IF A > 92 THEN A = 0:B = 191:C = 278:D = 0
270 GOTO 40
279 REM --SIDE RAYS--
280 HPLLOT 0,96 TO INT(RND(1)*279),INT(RND(1)*191)
290 HPLLOT 279,96 TO INT(RND(1)*279),INT(RND(1)*191)
300 GOTO 40
309 REM --VERTICAL BARS--
310 A = 277
320 HPLLOT A,0 TO A,191:HPLLOT A+1,0 TO A+1,191
330 HPLLOT A+2,0 TO A+2,191
340 A = A-12:IF A < 1 THEN A = 277
350 GOTO 40
359 REM --PEACOCK FEATHERS--
360 A = 70
370 IF A > 210 THEN A = 70
380 HPLLOT 140,191 TO A,0:A = A+3:GOTO 40
389 REM --SOLID FRAMES--
390 A = 0:B = 210:C = 191:D = 70
400 HPLLOT D,A TO D,C TO B,C TO B,A TO D,A
410 HPLLOT D+1,A TO D+1,C:HPLLOT B+1,C TO B+1,A
420 A = A+1:B = B-1:C = C-1:D = D+1
430 IF B < 40 THEN A = 0:B = 210:C = 191:D = 70
440 GOTO 40
449 REM --HORIZONTAL BARS--
450 A = 0
460 HPLLOT 0,A TO 279,A:HPLLOT 0,A+1 TO 279,A+1
470 A = A+8:IF A > 185 THEN A = 0
480 GOTO 40
489 REM --DIAGONALS--
490 A = 0:B = 181:C = 10:D = 191
500 HPLLOT A,B TO C,D:B = B-5:C = C+5
510 IF B < 0 THEN B = 0:A = A+4
520 IF C > 279 THEN C = 279:D = D-4
530 IF D < 0 THEN A = 0:B = 181:C = 10:D = 191
540 GOTO 40

```


Atari 800/XL/XE w/GTIA chip/Fun Graphics

```
10 GRAPHICS 11:OPEN #1,4,0,"K":CF=0:F=0:NP=1:ST=0
20 L=4:SETCOLOR 4,0,L*2:MF=INT(RND(1)*15)+1
30 M=INT(RND(1)*8)+1:SC=INT(RND(1)*15)+1
40 IF PEEK(764)=255 THEN 150
50 GET #1,K:K=K-32*(K>96)*(K<123)
60 N=K-48:IF N>0 AND N<9 THEN NP=1:M=N:ST=0:GOTO 150
70 IF N<0 AND N<-9 THEN 100
80 L=L-(N=9)+(N=0):L=L-(L>7)+(L<1)
90 SETCOLOR 4,0,L*2:GOTO 150
100 IF K>64 AND K<80 THEN CF=1:COLOR K-64:GOTO 200
110 IF K=155 THEN ST=1:GRAPHICS 11:GOTO 50
120 IF K=80 THEN NP=1:M=INT(RND(1)*8)+1:GOTO 150
130 IF K=82 THEN CF=0:SC=INT(RND(1)*15)+1:MF=INT(RND(1)*15)+1:F=0:GOTO 180
140 IF K=32 THEN ST= NOT ST:IF ST THEN 50
150 IF CF THEN 200
160 IF SC+F>15 THEN COLOR SC+F-15:GOTO 190
170 IF SC+F=0 THEN SC=SC+1
180 COLOR SC+F
190 F=F+1:IF F=MF THEN F=0
200 IF ST THEN 50
210 IF NOT NP THEN ON M GOTO 230,260,310,350,380,410,470,520
220 NP=0:ON M GOTO 230,250,310,340,370,400,460,510
229 REM --CENTER RAYS--
230 A=RND(1)*191:B=RND(1)*79
240 PLOT 40,96:DRAWTO B,A:GOTO 40
249 REM --STEP FRAMES--
250 A=0:B=79:C=191:D=0
260 PLOT D,A:DRAWTO B,A
270 DRAWTO B,C:DRAWTO D,C:DRAWTO D,A
280 A=A+2:B=B-2:C=C-2:D=D+2
290 IF A=38 THEN A=0:B=79:C=191:D=0
300 GOTO 40
309 REM --SIDE RAYS--
310 PLOT 0,85:DRAWTO RND(1)*79,RND(1)*191
320 PLOT 79,85:DRAWTO RND(1)*79,RND(1)*191
330 GOTO 40
339 REM --VERTICAL BARS--
340 A=79
350 PLOT A,0:DRAWTO A,191:A=A-4:IF A<1 THEN A=79
360 GOTO 40
369 REM --PEACOCK FEATHER--
370 A=0
380 IF A>75 THEN A=0
390 PLOT 40,191:DRAWTO A,0:A=A+3:GOTO 40
399 REM --SOLID FRAMES--
400 A=15:B=59:C=171:D=20
410 PLOT D,A:DRAWTO D,C
420 DRAWTO B,C:DRAWTO B,A:DRAWTO D,A
430 A=A+1:B=B-1:C=C-1:D=D+1
440 IF B<0 THEN A=15:B=59:C=171:D=20
450 GOTO 40
459 REM --HORIZONTAL BARS--
460 A=0
470 PLOT 0,A:DRAWTO 79,A
480 PLOT 0,A+1:DRAWTO 79,A+1:A=A+8
490 IF A>185 THEN A=0
500 GOTO 40
509 REM --DIAGONALS--
510 A=0:B=181:C=10:D=191
520 PLOT A,B:DRAWTO C,D
610 B=B-5:C=C+5:IF C>79 THEN C=79:D=D-3
620 IF B<0 THEN B=0:A=A+2
630 IF A>79 THEN A=0:B=181:C=10:D=191
640 GOTO 40
```

Commodore 128/Fun Graphics

```
10 GRAPHIC 3,1:CF=0:F=0:NP=-1:SD=0
20 COLOR 2,8:COLOR 0,1:MF=INT(RND(1)*16)+1
30 M=INT(RND(1)*16)+1:SC=INT(RND(1)*16)+1
40 GET K$:IF K$="" THEN 110
50 K=ASC(K$):N=K-48:IF N>0 AND N<9 THEN NP=-1:M=N:SD=0:GOTO 110
60 IF K>64 AND K<80 THEN CF=1:COLOR 2,K-63:GOTO 160
70 IF K=13 THEN SD=1:GRAPHIC 3,1:GOTO 40
80 IF K=80 THEN NP=-1:M=INT(RND(1)*8)+1:GOTO 110
90 IF K=82 THEN CF=0:SC=INT(RND(1)*16)+1:MF=INT(RND(1)*16)+1:F=0:GOTO 130
100 IF K=32 THEN SD= NOT SD:IF SD THEN 40
110 IF CF THEN 160
120 IF SC+F>16 THEN COLOR 2,SC+F-14:GOTO 150
130 IF SC+F=1 THEN SC=SC+1
140 COLOR 2,SC+F
150 F=F+1:IF F=MF THEN F=1
160 IF SD THEN 40
170 IF NOT NP THEN ON M GOTO 190,220,260,290,320,350,390,430
180 NP=0:ON M GOTO 190,210,260,280,310,340,380,420
189 REM --CENTER RAYS--
190 A=RND(1)*199:B=RND(1)*159
200 DRAW 2,80,100 TO B,A:GOTO 40
209 REM --STEP FRAMES--
210 A=0:B=159:C=199:D=0
220 BOX 2,0,A,B,C
230 A=A+2:B=B-2:C=C-2:D=D+2
240 IF A=40 THEN A=0:B=159:C=199:D=0
250 GOTO 40
259 REM --SIDE RAYS--
260 DRAW 2,0,100 TO RND(1)*159,RND(1)*199
270 DRAW 2,159,100 TO RND(1)*159,RND(1)*199:GOTO 40
279 REM --VERTICAL BARS--
280 A=159
290 DRAW 2,A,0 TO A,199:A=A-4:IF A<1 THEN A=159
300 GOTO 40
309 REM --PEACOCK FEATHERS--
310 A=0
320 IF A>159 THEN A=0
330 DRAW 2,80,199 TO A,0:A=A+3:GOTO 40
339 REM --SOLID FRAMES--
340 A=20:B=144:C=179:D=15
350 BOX 2,0,A,B,C:A=A+1:B=B-1:C=C-1:D=D+1
360 IF B<0 THEN A=20:B=144:C=179:D=15
370 GOTO 40
379 REM --HORIZONTAL BARS--
380 A=0
390 DRAW 2,0,A TO 159,A:DRAW 2,0,A+1 TO 159,A+1:A=A+8
400 IF A>185 THEN A=0
410 GOTO 40
419 REM --DIAGONALS--
420 A=0:B=198:C=1:D=199
430 DRAW 2,A,B TO C,D
440 B=B-5:C=C+5:IF C>159 THEN C=159:D=D-5
450 IF B<0 THEN B=0:A=A+5
460 IF D<1 THEN A=0:B=198:C=1:D=199
470 GOTO 40
```

IBM PC & compatibles/Fun Graphics

```
10 KEY OFF:CLS:RANDOMIZE:SCREEN 1,0:CLS
20 MF=INT(RND*1)+1:SC=INT(RND*3)+1
30 M=INT(RND*8)+1:CF=0:NP=-1:ST=0
40 K$=INKEY$:IF K$="" THEN 130
```


GRAPHICS PROGRAM

```

50 K=ASC(K$):K=K-32*(K>96)*(K<123)
60 IF K>48 AND K<57 THEN NP=-1:M=K-48:ST=0:GOTO 130
70 IF K>64 AND K<68 THEN CF=1:SC=K-64:GOTO 160
80 IF K=57 THEN MF=MF+1:IF MF>1 THEN MF=0
90 IF K=13 THEN ST=1:CLS:GOTO 40
100 IF K=80 THEN NP=-1:M=INT(RND*8)+1:GOTO 130
110 IF K=82 THEN CF=0:SC=INT(RND*3)+1:MF=INT(RND*1)+1:
GOTO 130
120 IF K=32 THEN ST=NOT ST:IF ST THEN 40
130 IF CF THEN 160
140 SC=SC+1:IF SC>3 THEN SC=1
150 COLOR 0,MF
160 IF ST THEN 40
170 IF NOT NP THEN ON M GOTO 190,220,260,300,340,370,4
20,460
180 NP=0:ON M GOTO 190,210,260,290,330,360,410,450
189 REM --CENTER RAYS--
190 A=INT(RND*320):B=INT(RND*200)
200 LINE (160,100)-(A,B),SC:GOTO 40
209 REM --STEP FRAMES--
210 A=0:B=199:C=319:D=0
220 LINE (D,A)-(C,A),SC:LINE (C,B),SC:LINE (D,B),SC
230 LINE (D,A),SC:A=A+3:B=B-3:C=C-3:D=D+3
240 IF A>92 THEN A=0:B=199:C=319:D=0
250 GOTO 40
259 REM --SIDE RAYS--
260 LINE (0,100)-(INT(RND*319),INT(RND*199)),SC
270 LINE (319,100)-(INT(RND*319),INT(RND*199)),SC
280 GOTO 40
289 REM --VERTICAL BARS--
290 A=318
300 LINE (A,0)-(A,199),SC:LINE (A+1,0)-(A+1,199),SC
310 A=A-12:IF A<1 THEN A=318
320 GOTO 40
329 REM --PEACOCK FEATHERS--
330 A=20
340 IF A>300 THEN A=20
350 LINE (160,199)-(A,0),SC:A=A+3:GOTO 40
359 REM --SOLID FRAMES--
360 A=5:B=240:C=195:D=80
370 LINE (D,A)-(B,C),SC,B
380 A=A+1:B=B-1:C=C-1:D=D+1
390 IF B<60 THEN A=5:B=240:C=195:D=80
400 GOTO 40
409 REM --HORIZONTAL BARS--
410 A=0
420 LINE (0,A)-(319,A),SC:LINE (0,A+1)-(319,A+1),SC
430 A=A+8:IF A>185 THEN A=0
440 GOTO 40
449 REM --DIAGONALS--
450 A=0:B=189:C=10:D=199
460 LINE (A,B)-(C,D),SC:B=B-5:C=C+5
470 IF B<0 THEN B=0:A=A+4
480 IF C>319 THEN C=319:D=D-4
490 IF D<0 THEN A=0:B=189:C=10:D=199
500 GOTO 40

```

```

90 IF K=13 THEN ST=1:PCLS:GOTO 30
100 IF K=80 THEN NP=1:M=RND(8):GOTO 130
110 IF K=82 THEN CF=0:SC=RND(3):F=0:GOTO 150
120 IF K=32 THEN ST=NOT ST:IF ST THEN 30
130 IF CF THEN 160
140 IF SC>4 THEN SC=2
150 COLOR SC,1:SC=SC+1
160 IF ST THEN 30
170 IF NP<1 THEN ON M GOTO 190,220,270,310,350,380,
440,490
180 NP=0:ON M GOTO 190,210,270,300,340,370,430,480
189 REM --CENTER RAYS--
190 A=RND(191):B=RND(255)
200 LINE (128,96)-(B,A),PSET:GOTO 30
209 REM --STEP FRAMES--
210 A=0:B=255:C=191:D=0
220 LINE (D,A)-(B,A),PSET:LINE (B,A)-(B,C),PSET
230 LINE (B,C)-(D,C),PSET:LINE (D,C)-(D,A),PSET
240 A=A+2:B=B-2:C=C-2:D=D+2
250 IF A=76 THEN A=0:B=255:C=191:D=0
260 GOTO 30
269 REM --SIDE RAYS--
270 LINE (0,85)-(RND(255),RND(191)),PSET
280 LINE (255,85)-(RND(255),RND(191)),PSET
290 GOTO 30
299 REM --VERTICAL BARS--
300 A=255
310 LINE (A,0)-(A,191),PSET
320 A=A-5:IF A<1 THEN A=255
330 GOTO 30
339 REM --PEACOCK FEATHERS--
340 A=0
350 IF A>251 THEN A=0
360 LINE (128,191)-(A,0),PSET:A=A+3:GOTO 30
369 REM --SOLID FRAMES--
370 A=15:B=245:C=171:D=20
380 LINE (D,A)-(D,C),PSET:LINE (D,C)-(B,C),PSET
390 LINE (B,C)-(B,A),PSET:LINE (B,A)-(D,A),PSET
400 A=A+1:B=B-1:C=C-1:D=D+1
410 IF C<0 THEN A=15:B=245:C=171:D=20
420 GOTO 30
429 REM --HORIZONTAL BARS--
430 A=0
440 LINE (0,A)-(255,A),PSET
450 LINE (0,A+1)-(255,A+1),PSET:A=A+4
460 IF A>185 THEN A=0
470 GOTO 30
479 REM --DIAGONALS--
480 A=0:B=181:C=10:D=191
490 LINE (A,B)-(C,D),PSET:B=B-5:C=C+5
500 IF C>255 THEN C=255:D=D-5
510 IF B<0 THEN B=0:A=A+5
520 IF A>255 THEN A=0:B=181:C=10:D=191
530 GOTO 30

```

Tandy Color Computer w/Extended Color BASIC/ Fun Graphics

```

10 PMODE 3,1:SCREEN 1,0:PCLS:CF=0:NP=1:ST=0
20 M=RND(8):SC=RND(3)
30 K$=INKEY$:IF K$="" THEN 130
40 K=ASC(K$):N=K-48:IF N>0 AND N<9 THEN NP=1:M=N:ST=0:
GOTO 130
50 IF N<>9 THEN 80
60 MF=MF+1:IF MF>1 THEN MF=0
70 SCREEN 1,MF
80 IF K>64 AND K<68 THEN CF=1:COLOR K-63,1:GOTO 160

```


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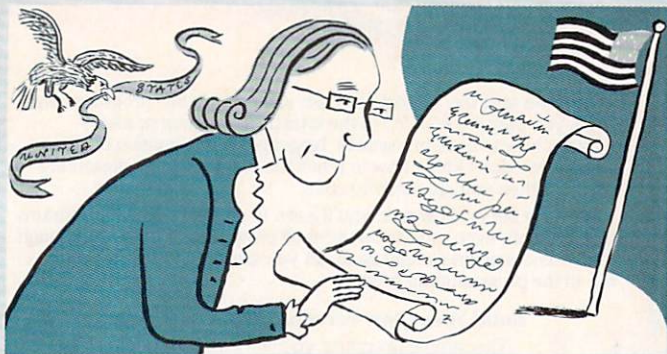
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CELEBRATE THE 200TH ANNIVERSARY OF THE UNITED STATES CONSTITUTION WITH MEMORY MADNESS

BY STEVE C.M. CHEN
AND KAREN KANE



When our Founding Fathers gathered in Philadelphia 200 years ago, they debated national issues and wrote the Constitution of the United States. But did you know that when Patrick Henry was asked to serve as a Virginia delegate, he refused by saying, "I smelt a rat"? Or that thunder and lightning interrupted a fiery speech that Henry gave against the Constitution?

The history of the Constitution is filled with interesting facts and anecdotes, and to help celebrate its 200th anniversary, we've developed the matching game, *Memory Madness*. Playing the game will help you sharpen memory skills, and you can learn about the U.S. Constitution at the same time.

Our program can be played by one or two people as a simple letter-matching game or as a quiz on facts about the U.S. Constitution. The object is to match as many pairs of letters or histori-

cal items as possible. For example, one square may contain the words *Benjamin Franklin*, and another, *the oldest delegate to the Constitutional Convention*. You must select these two squares in a single turn to make a match. To select a square, type its number and press RETURN or ENTER. Either game can be played with a small-, medium-, large-, extra large-, or jumbo-sized board. Naturally, the more pairs you must match, the more taxing it is to the memory.

When you successfully match two squares, you score a point. In a two-player game, a matched pair also wins you another turn. The player with the most matched pairs wins.

There is an added bonus when playing one of the larger Constitution game boards. A quotation from Article XI of the U.S. Constitution is hidden behind the squares and is revealed as matches are made. The first person who can type in the exact

quote receives the remaining points. Scores are tallied and the game is over.

Each time you RUN the program, the position of the matching pairs changes but the quotation stays the same. If you al-

ready know what the hidden quotation is, you may choose to omit it from the game. Or, enter your own quotation and matching pairs by changing the DATA statements (see sidebar).

HOW TO ENTER YOUR OWN DATA

If you would like to personalize *Memory Madness* with 24 matching facts about sports, 24 pairs of homonyms or synonyms, or any other topic that breaks into distinct pairs easily, simply change the DATA in lines 9010-9480. If a DATA statement includes any commas or colons, you must put quotation marks at the beginning and end of the item. For an example see line 9190 in the program. Finally, if you change the hidden quotation in line 9000, it must be 48 characters or less (including spaces) and cannot contain any commas or colons. The following additional restrictions apply:

Apple & IBM:

On Apple and IBM PC & compatible machines, keep each DATA item less than 79 characters (not including line number and the keyword DATA). When counting the number of characters in a DATA item be sure to include the spaces between words. You must also change the PRINT statement (line 100 for IBM; lines 90 and 100 for Apple) so that it applies to your new topic.

Commodore:

On the Commodore 64 and 128, each DATA statement must be 79 characters or less (including the line number and the keyword DATA). The PRINT statements in lines 110 and 120 should also be changed to include your new topic.

Apple II series/Memory Madness

```
10 DIM DMS(8,6),PAS(48),PQS(3),ZS(2)
20 DIM DC(8,6),MC(2),NL(2),XP(8),YP(6)
30 SP$ = CHR$(32):CLS = SP$:FR$ = ""
40 FOR C = 2 TO 40:CLS = CLS+SP$:FR$ = FR$+" "
50 NEXT C:G$ = CHR$(7):PQS(0) = "YOUR"
60 PQS(1) = "PLAYER #1'S":PQS(2) = "PLAYER #2'S"
70 GOSUB 2000:PRINT "WOULD YOU LIKE TO ...":PRINT
80 PRINT "<1> PLAY A SIMPLE MATCHING GAME, OR"
90 PRINT "<2> PLAY A MATCHING GAME ABOUT THE"
100 PRINT TAB(5);"UNITED STATES CONSTITUTION?";
110 GET K$
120 IF K$ < "1" OR K$ > "2" THEN PRINT G$;:GOTO 110
130 GF = (K$ = "1"):GOSUB 2000
140 PRINT "HOW MANY PLAYERS ARE THERE? ";
150 GET K$
160 IF K$ < "1" OR K$ > "2" THEN PRINT G$;:GOTO 150
170 PC = VAL(K$):FOR C = 1 TO PC
180 GOSUB 2000
190 PRINT "WHAT ARE ";PQS(C-(PC = 1));" INITIALS";
200 INPUT "? ";NAS(C):T = LEN(NAS(C))
210 IF T < 2 OR T > 3 THEN PRINT G$;:GOTO 180
220 IF C = 2 THEN IF NAS(1) = NAS(2) THEN PRINT G$;:GOTO 180
230 NL(C) = INT(T/2):MC(C) = 0:NEXT C:GOSUB 2000
240 PRINT "HOW LARGE A GAME BOARD WOULD YOU LIKE?"
250 PRINT:PRINT "<1> JUMBO (8 X 6)"
260 PRINT "<2> EXTRA LARGE (6 X 6)"
270 PRINT "<3> LARGE (6 X 4)"
```



```

280 PRINT "<4> MEDIUM (4 X 4)"
290 PRINT "<5> SMALL (3 X 2)";
300 GET K$:SEL = VAL(K$)
310 IF SEL < 1 OR SEL > 5 THEN PRINT G$;GOTO 300
320 GOSUB 2000:FOR C = 1 TO 5
330 IF C = SEL THEN READ LM,XL,YL,WW,WH,DX,DY:GOTO 350
340 FOR L = 1 TO 7:READ Z:NEXT L
350 NEXT C:MAX = XL*YL/2
360 FOR X = 1 TO XL:FOR Y = 1 TO YL:DC(X,Y) = 0
370 DMS(X,Y) = "":NEXT Y,X:IF GF THEN 450
380 READ Q$:IF SEL <> 5 THEN WH = 1:DY = 0:GOTO 400
390 WH = 3:DY = 1
400 T = LEN(Q$):IF T > MAX*2 THEN QF = 0:GOTO 450
410 PRINT "DO YOU WANT A HIDDEN QUOTATION IN THIS
420 PRINT "GAME? ";:GET K$:GOSUB 2000
430 IF K$ <> "Y" AND K$ <> CHR$(121) THEN QF = 0:GOTO
450
440 QF = 1:IF T <> MAX*2 THEN QTS = Q$+LEFT$(CLS,MAX*2
-T)
450 FOR C = 65 TO 65+MAX-1:FOR W = 1 TO 2
460 TX = INT(RND(1)*XL)+1:TY = INT(RND(1)*YL)+1
470 IF DMS(TX,TY) <> "" THEN 460
480 IF GF THEN 590
490 V = (TY-1)*XL+TX:READ TS:TS = STR$(V)+":"+TS
500 FOR L = 1 TO 3:BF = 1
510 B = L*40:A = (L-1)*40+1:IF LEN(TS) < B THEN 570
520 FOR X = B TO A STEP -1:KS = MID$(TS,X,1)
530 IF KS = SP$ THEN BF = 0:T = X:X = A
540 NEXT X:IF BF THEN TS = LEFT$(TS,B-1)+"-"+MID$(TS,B
):GOTO 570
550 IF T = B THEN 570
560 TS = LEFT$(TS,T)+LEFT$(CLS,B-T)+MID$(TS,T+1)
570 NEXT L:IF LEN(TS) > 120 THEN TS = LEFT$(TS,120)
580 PAS(V) = TS
590 DMS(TX,TY) = CHR$(C):NEXT W,C
600 FOR X = 1 TO XL:XP(X) = LM+(WW+1)*(X-1)+DX:NEXT X
610 FOR Y = 1 TO YL:YP(Y) = (WH+1-(SEL < 3))*(GF = 0)*
(Y-1)+DY+3:NEXT Y
620 P = 1:TS = LEFT$(FR$,WW*XL+XL+1)
630 VTAB 2:HTAB 1:FOR Y = 1 TO YP(YL)-YP(1)+WH+2
640 PRINT TAB(LM-1);TS:NEXT Y
650 FOR Y = 1 TO YL:FOR X = 1 TO XL
660 DF = (DC(X,Y) = 0):GOSUB 2500
670 IF DC(X,Y) AND QF THEN GOSUB 3000
680 NEXT X,Y:IF PC = 1 THEN 740
690 FOR C = 1 TO 2:VTAB 19:HTAB 24+8*C-LEN(NAS(C))
700 PRINT NAS(C):NEXT C:PRINT TAB(18);"SCORE:"
710 VTAB 24:HTAB 15:PRINT NAS(P);"S TURN";
720 FOR C = 1 TO 2:VTAB 20
730 HTAB 24+8*C-LEN(STR$(MC(C))):PRINT MC(C):NEXT C
740 HS = "CHOOSE A SQUARE. --> ":TX = 0:TY = 0
750 GOSUB 3500:TX = X:TY = Y
760 AS = DMS(X,Y):IF GF THEN 780
770 VTAB 11:PRINT PAS(V)
780 HS = "WHICH IS THE MATCHING SQUARE? --> "
790 GOSUB 3500:BS = DMS(X,Y):IF GF THEN 810
800 VTAB 15:PRINT PAS(V)
810 MF = (AS = BS):IF NOT MF THEN 850
820 VTAB 21:PRINT "YOU HAVE A MATCH!"
830 MC(P) = MC(P)+1:DC(X,Y) = 1:DC(TX,TY) = 1
840 ON NOT QF GOTO 860:GOTO 870
850 VTAB 21:PRINT G$;G$;"THIS IS NOT A MATCH!"
860 GOSUB 4000:ON GF GOTO 1020:GOTO 1010
870 GOSUB 3000:VTAB YP(TY):HTAB XP(TX)
880 PRINT MID$(QTS,(TY-1)*XL+TX,1):VTAB 22
890 IF MC(1)+MC(2)+1 = MAX THEN GOSUB 4000:GOTO 1010
900 PRINT "PRESS <G> TO GUESS THE QUOTATION,"
910 PRINT "OR ANY OTHER KEY TO CONTINUE.";
920 GET K$:IF K$ <> "G" AND K$ <> CHR$(103) THEN 1010
930 GOSUB 2000:INPUT "WHAT IS THE QUOTATION? ";TS
940 IF TS = Q$ THEN 970
950 PRINT G$;G$;"SORRY, THAT'S NOT RIGHT!"

```

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FUN-LEARNING PROGRAM

```

960 PRINT:GOSUB 4000:GOSUB 2000:GOTO 630
970 PRINT:PRINT "CONGRATULATIONS, ";NAS(P);"!
980 PRINT "YOU HAVE GUESSED THE QUOTATION"
990 PRINT "CORRECTLY!"
1000 PRINT:MC(P) = MC(P)+MAX-MC(1)-MC(2):GOTO 1200
1010 VTAB 11:HTAB 1:FOR L = 1 TO 7:PRINT CLS;:NEXT L
1020 IF PC = 1 OR MF THEN 1050
1030 IF PC = 2 THEN P = P+1:IF P = 3 THEN P = 1
1040 VTAB 24:HTAB 15:PRINT LEFT$(CLS,10);
1050 VTAB 21:HTAB 1:FOR C = 1 TO 3:PRINT CLS;
1060 NEXT C:IF MF THEN 1090
1070 DF = 1:GOSUB 2500
1080 X = TX:Y = TY:GOSUB 2500:GOTO 1130
1090 IF QF THEN 1120
1100 VTAB YP(Y):HTAB XP(X)-NL(P):PRINT NAS(P)
1110 VTAB YP(TY):HTAB XP(TX)-NL(P):PRINT NAS(P)
1120 IF MC(1)+MC(2) = MAX THEN 1140
1130 ON (PC = 1) GOTO 740:GOTO 710
1140 IF PC = 2 THEN 1180
1150 VTAB 19:PRINT "CONGRATULATIONS, ";NAS(P);"!
1160 PRINT "YOU HAVE SUCCESSFULLY MATCHED ALL THE"
1170 PRINT "SQUARES." :END
1180 VTAB 24:HTAB 15:PRINT LEFT$(CLS,10);
1190 VTAB 19:HTAB 1:PRINT CLS;:PRINT CLS;:VTAB 19
1200 IF MC(1) = MC(2) THEN PRINT "THIS GAME IS A DRAW."
:END
1210 T = 2:IF MC(1) > MC(2) THEN T = 1
1220 PRINT NAS(T);" WINS WITH A SCORE OF"
1230 PRINT MC(T);" OUT OF ";MAX;" MATCHES." :END
2000 HOME:PRINT TAB(14);"MEMORY MADNESS":PRINT:RETURN
2500 IF DF THEN INVERSE
2510 TS = LEFT$(CLS,WH):FOR YC = YP(Y) TO YP(Y)+WH-1
2520 VTAB YC-DY:HTAB XP(X)-DX:PRINT TS:NEXT YC
2530 IF NOT DF THEN 2560
2540 VTAB YP(Y):HTAB XP(X)
2550 PRINT XL*(Y-1)+X:NORMAL:RETURN
2560 IF GF = 0 OR QF THEN RETURN
2570 VTAB YP(Y):HTAB XP(X):PRINT DMS(X,Y):RETURN
3000 VTAB YP(Y):HTAB XP(X)
3010 PRINT MID$(QT$, (Y-1)*XL+X,1):RETURN
3500 CX = 1:Z$(1) = "":Z$(2) = ""
3510 VTAB 21:HTAB 1:PRINT HS;SPS;SPS
3520 VTAB 21:HTAB LEN(HS)+CX
3530 GET K$:IF K$ = CHR$(3) THEN END
3540 IF K$ = CHR$(2) OR K$ = CHR$(127) THEN 3600
3550 IF K$ = CHR$(13) THEN 3630
3560 IF K$ < "0" OR K$ > "9" THEN PRINT G$;GOTO 3520
3570 IF CX = 3 THEN PRINT G$;GOTO 3520
3580 VTAB 21:HTAB LEN(HS)+CX:PRINT K$
3590 Z$(CX) = K$:CX = CX+1:GOTO 3520
3600 IF CX = 1 THEN PRINT G$;G$;GOTO 3520
3610 IF CX = 2 THEN 3500
3620 Z$(2) = "":CX = 2:GOTO 3520
3630 V = VAL(Z$(1)+Z$(2))
3640 VTAB 21:HTAB 1:PRINT CLS
3650 IF V < 1 OR V > MAX*2 THEN PRINT G$;GOTO 3500
3660 Y = INT((V-1)/XL)+1:X = V-(Y-1)*XL
3670 IF (TX = X AND TY = Y) OR DC(X,Y) THEN PRINT G$;G
$;:GOTO 3500
3680 DF = 0:GOSUB 2500:RETURN
4000 PRINT "PRESS ANY KEY TO CONTINUE." :GET K$:RETURN
4500 DATA 5,8,6,3,1,1,0,3,6,6,5,1,2,0,3,6,4,5,3,2,1
4510 DATA 5,4,4,7,3,3,1,3,3,2,11,5,5,2
9000 DATA THE SUPREME LAW OF THE LAND
9010 DATA WHERE THE CONTINENTAL CONGRESS MET IN 1787 T
O DISCUSS A NEW CONSTITUTION
9020 DATA PHILADELPHIA
9030 DATA HEADED THE CONTINENTAL CONGRESS
9040 DATA WASHINGTON
9050 DATA FIRST CONSTITUTION FOR THE UNITED STATES
9060 DATA THE ARTICLES OF CONFEDERATION
9070 DATA FINANCIER OF THE REVOLUTION AND MEMBER OF TH

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```

E CONTINENTAL CONGRESS
9080 DATA ROBERT MORRIS
9090 DATA AMERICANS WHO FAVORED KING GEORGE III
9100 DATA TORIES
9110 DATA RECORDED THE DEBATES AT THE PHILADELPHIA CON
VENTION
9120 DATA JAMES MADISON
9130 DATA GOVERNMENT BY THE PEOPLE
9140 DATA DEMOCRACY
9150 DATA A CHANGE OR ADDITION TO THE CONSTITUTION
9160 DATA AMENDMENT
9170 DATA THE FIRST 10 AMENDMENTS TO THE CONSTITUTION
9180 DATA BILL OF RIGHTS
9190 DATA "TERM OF MEMBERSHIP IS TWO YEARS, MINIMUM AG
E IS 25"
9200 DATA THE HOUSE OF REPRESENTATIVES
9210 DATA "TERM OF MEMBERSHIP IS SIX YEARS, MINIMUM AG
E IS 30"
9220 DATA THE SENATE
9230 DATA "TERM OF OFFICE IS FOUR YEARS, MINIMUM AGE I
S 35"
9240 DATA THE PRESIDENCY
9250 DATA SIGNING OF THE CONSTITUTION
9260 DATA "SEPTEMBER 17, 1787"
9270 DATA SYSTEM WHICH DIVIDES POWER BETWEEN NATIONAL
AND STATE GOVERNMENTS
9280 DATA FEDERALISM
9290 DATA 1ST AMENDMENT
9300 DATA "FREEDOM OF RELIGION, SPEECH, ASSEMBLY, AND
THE PRESS"
9310 DATA 2ND AMENDMENT
9320 DATA THE RIGHT TO BEAR ARMS
9330 DATA 5TH AMENDMENT
9340 DATA GUARANTEE AGAINST SELF-INCRIMINATION
9350 DATA 19TH AMENDMENT
9360 DATA GIVES WOMEN THE RIGHT TO VOTE
9370 DATA FIRST FEMALE SUPREME COURT JUDGE
9380 DATA SANDRA DAY O'CONNOR
9390 DATA FIRST STEP IN REMOVING A HIGH OFFICIAL FROM
OFFICE
9400 DATA IMPEACHMENT PROCEEDINGS
9410 DATA PROTECTS SUSPECTS FROM BEING JAILED WITHOUT
A STATED CAUSE
9420 DATA WRIT OF HABEUS CORPUS
9430 DATA REDUCED THE TIME BETWEEN THE ELECTION AND IN
AUGURATION OF A PRESIDENT
9440 DATA LAME DUCK AMENDMENT
9450 DATA LOWERED THE VOTING AGE FROM 21 TO 18
9460 DATA 26TH AMENDMENT
9470 DATA THREE BRANCHES OF GOVERNMENT
9480 DATA "LEGISLATIVE, EXECUTIVE, AND JUDICIARY"

```

Commodore 64 & 128 (C 64 mode)/Memory Madness

```

10 DIM DMS(8,6),PAS(48),PQS(3),Z$(2)
20 DIM DC(8,6),MC(2),NL(2),XP(8),YP(6)
30 POKE 649,10:POKE 650,0:POKE 53280,12:POKE 53281,12
40 S=54272:FOR C=0 TO 23:POKE S+C,0:NEXT C
50 POKE S+5,12:POKE S+6,0:POKE S+1,100:POKE S+24,15
60 BK$=CHR$(144):WH$=CHR$(5):SP$=CHR$(32):CLS$=SP$
70 FOR C=2 TO 39:CLS$=CLS$+SP$:NEXT C:PQS(0)="YOUR"
80 PQS(1)="PLAYER #1'S":PQS(2)="PLAYER #2'S"
90 GOSUB 2000:PRINT "WOULD YOU LIKE TO ...":PRINT
100 PRINT "<1> PLAY A SIMPLE MATCHING GAME, OR"
110 PRINT "<2> PLAY A MATCHING GAME ABOUT THE"

```


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FUN-LEARNING PROGRAM

```

120 PRINT TAB(4);"UNITED STATES CONSTITUTION?"
130 GOSUB 2500
140 IF K$<"1" OR K$>"2" THEN DL=50:GOSUB 3000:GOTO 130
150 GF=(K$="1"):GOSUB 2000
160 PRINT "HOW MANY PLAYERS ARE THERE?"
170 GOSUB 2500
180 IF K$<"1" OR K$>"2" THEN DL=50:GOSUB 3000:GOTO 170
190 PC=VAL(K$):FOR C=1 TO PC
200 GOSUB 2000
210 PRINT "WHAT ARE ";PQ$(C+(PC=1));" INITIALS";
220 INPUT NAS(C):T=LEN(NAS(C))
230 PRINT@65,TB$;PRINT@417,TB$;
240 IF C=2 THEN IF NAS(1)=NAS(2) THEN DL=50:GOSUB 3000
:GOTO 200
250 NL(C)=INT(T/2):MC(C)=0:NEXT C:GOSUB 2000
260 PRINT "HOW LARGE A GAME BOARD WOULD YOU LIKE?"
270 PRINT:PRINT "<1> JUMBO (8 X 6)"
280 PRINT "<2> EXTRA LARGE (6 X 6)"
290 PRINT "<3> LARGE (6 X 4)"
300 PRINT "<4> MEDIUM (4 X 4)"
310 PRINT "<5> SMALL (3 X 2)"
320 GOSUB 2500:SEL=VAL(K$)
330 IF SEL<1 OR SEL>5 THEN DL=50:GOSUB 3000:GOTO 320
340 GOSUB 2000:FOR C=1 TO 5
350 IF C=SEL THEN READ LM,XL,YL,WW,WH,DX,DY:GOTO 370
360 FOR L=1 TO 7:READ Z:NEXT L
370 NEXT C:MAX=XL*YL/2:FOR X=1 TO XL:FOR Y=1 TO YL
380 DC(X,Y)=0:DMS(X,Y)="":NEXT Y,X:IF GF THEN 460
390 TM=1:READ QS:IF SEL<>5 THEN WH=1:DY=0:GOTO 410
400 WH=3:DY=1
410 T=LEN(QS):IF T>MAX*2 THEN QF=0:GOTO 460
420 PRINT "DO YOU WANT A HIDDEN QUOTATION IN THIS?"
430 PRINT "GAME?":GOSUB 2500:GOSUB 2000
440 IF K$<"Y" THEN QF=0:GOTO 460
450 QF=1:QT$=QS+LEFT$(CL$,MAX*2-T)
460 FOR C=65 TO 65+MAX-1:FOR W=1 TO 2
470 TX=INT(RND(1)*XL)+1:TY=INT(RND(1)*YL)+1
480 IF DMS(TX,TY)<>" " THEN 470
490 IF GF THEN 590
500 V=(TY-1)*XL+TX:READ TS:TS=MID$(STR$(V),2)+":"+TS
510 FOR L=1 TO 3:BF=1
520 B=L*39:A=(L-1)*39+1:IF LEN(TS)<B THEN 570
530 FOR X=B TO A STEP -1:K$=MID$(TS,X,1)
540 IF K$=SP$ THEN BF=0:T=X:X=A
550 NEXT X:IF BF THEN TS=LEFT$(TS,B-1)+"-"+MID$(TS,B):
GOTO 570
560 TS=LEFT$(TS,T)+LEFT$(CL$,B-T)+MID$(TS,T+1)
570 NEXT L:IF LEN(TS)>117 THEN TS=LEFT$(TS,117)
580 PAS(V)=TS
590 DMS(TX,TY)=CHR$(C):NEXT W,C
600 P=1:FOR X=1 TO XL:XP(X)=LM+(WW+1)*(X-1)+DX:NEXT X
610 FOR Y=1 TO YL
620 YP(Y)=(WH+1-(SEL<3)*(GF=0))*(Y-1)+DY+2:NEXT Y
630 TS=CHR$(18)+CHR$(31)+LEFT$(CL$,WW*XL+XL+1)
640 POKE 214,1:PRINT:FOR Y=1 TO YP(YL)-YP(1)+WH+2
650 PRINT SPC(LM-1);TS:NEXT Y
660 FOR Y=1 TO YL:FOR X=1 TO XL
670 DF=(DC(X,Y)=0):GOSUB 3500
680 IF DC(X,Y) AND QF THEN GOSUB 4000
690 NEXT X,Y:IF PC=1 THEN 770
700 FOR C=1 TO 2:POKE 214,18:PRINT
710 PRINT TAB(23+8*C-LEN(NAS(C)));NAS(C):NEXT C
720 PRINT TAB(20);"SCORE:"
730 POKE 214,23:PRINT
740 PRINT WH$;TAB(14);NAS(P);"S TURN";BK$;
750 FOR C=1 TO 2:POKE 214,19:PRINT
760 PRINT TAB(23+8*C-LEN(STR$(MC(C))))MC(C):NEXT C
770 HS="CHOOSE A SQUARE. -->":TX=0:TY=0:GOSUB 5000
780 AS=DMS(X,Y):IF GF THEN 800
790 POKE 214,10:PRINT:TS=PAS(V):GOSUB 4500
800 TX=X:TY=Y:HS="WHICH IS THE MATCHING SQUARE? -->"

```

```

810 GOSUB 5000:B$=DMS(X,Y):IF GF THEN 830
820 POKE 214,14:PRINT:TS=PAS(V):GOSUB 4500
830 MF=(AS=B$):IF NOT MF THEN 880
840 POKE 214,20:PRINT
850 PRINT WH$;"YOU HAVE A MATCH!";BK$
860 MC(P)=MC(P)+1:DC(X,Y)=-1:DC(TX,TY)=-1
870 ON -(NOT QF) GOTO 900:GOTO 910
880 POKE 214,20:PRINT:DL=50:GOSUB 3000
890 PRINT CHR$(28);"THIS IS NOT A MATCH!";BK$
900 GOSUB 5500:ON -GF GOTO 1080:GOTO 1070
910 GOSUB 4000:POKE 214,YP(TY):PRINT WH$
920 PRINT TAB(XP(TX));MID$(QT$, (TY-1)*XL+TX,1)
930 POKE 214,21:PRINT BK$
940 IF MC(1)+MC(2)+1=MAX THEN GOSUB 5500:GOTO 1070
950 PRINT "PRESS <G> TO GUESS THE QUOTATION,"
960 PRINT "OR ANY OTHER KEY TO CONTINUE."
970 GOSUB 2500:IF K$<"G" THEN 1070
980 GOSUB 2000:INPUT "WHAT IS THE QUOTATION";TS
990 IF TS=QS THEN 1030
1000 DL=100:GOSUB 3000
1010 PRINT CHR$(28);"SORRY, THAT'S NOT RIGHT!";BK$
1020 PRINT:GOSUB 5500:GOSUB 2000:GOTO 630
1030 PRINT:PRINT "CONGRATULATIONS, ";NAS(P);"!"
1040 PRINT "YOU HAVE GUESSED THE QUOTATION"
1050 PRINT "CORRECTLY!":PRINT
1060 MC(P)=MC(P)+MAX-MC(1)-MC(2):GOTO 1290
1070 POKE 214,10:PRINT:FOR L=1 TO 7:PRINT CL$:NEXT L
1080 IF PC=1 OR MF THEN 1110
1090 IF PC=2 THEN P=P+1:IF P=3 THEN P=1
1100 POKE 214,23:PRINT:PRINT TAB(14);LEFT$(CL$,10);
1110 POKE 214,20:PRINT:FOR C=1 TO 3:PRINT CL$
1120 NEXT C:IF MF THEN 1140
1130 DF=-1:GOSUB 3500:X=TX:Y=TY:GOSUB 3500:GOTO 1200
1140 IF QF THEN 1190
1150 POKE 214,YP(Y):PRINT
1160 PRINT TAB(XP(X)-NL(P));NAS(P)
1170 POKE 214,YP(TY):PRINT
1180 PRINT TAB(XP(TX)-NL(P));NAS(P)
1190 IF MC(1)+MC(2)=MAX THEN 1210
1200 ON -(PC=1) GOTO 770:GOTO 730
1210 IF PC=2 THEN 1260
1220 POKE 214,18:PRINT
1230 PRINT "CONGRATULATIONS, ";NAS(P);"!"
1240 PRINT "YOU HAVE SUCCESSFULLY MATCHED ALL THE"
1250 PRINT "SQUARES." :END
1260 POKE 214,23:PRINT:PRINT TAB(14);LEFT$(CL$,10);
1270 POKE 214,18:PRINT:PRINT CL$
1280 PRINT CL$:POKE 214,18:PRINT
1290 IF MC(1)=MC(2) THEN PRINT "THIS GAME IS A DRAW." :
PRINT:END
1300 T=2:IF MC(1)>MC(2) THEN T=1
1310 PRINT NAS(T);" WINS WITH A SCORE OF"
1320 PRINT MID$(STR$(MC(T)),2);" OUT OF";MAX;"MATCHES."
:END
2000 PRINT CHR$(147);TAB(13);BK$;"MEMORY MADNESS"
2010 PRINT:RETURN
2500 GET K$:ON -(K$="") GOTO 2500:RETURN
3000 POKE S+4,17:FOR D=1 TO DL:NEXT D
3010 POKE S+4,16:RETURN
3500 C$="":IF DF THEN C$=CHR$(18)+CHR$(158)
3510 TS=LEFT$(CL$,WW):FOR YC=YP(Y) TO YP(Y)+WH-1
3520 POKE 214,YC-DY:PRINT
3530 PRINT TAB(XP(X)-DX);C$;TS;BK$
3540 NEXT YC:IF NOT DF THEN 3580
3550 POKE 214,YP(Y):PRINT
3560 PRINT TAB(XP(X));C$;MID$(STR$(XL*(Y-1)+X),2);BK$
3570 RETURN
3580 IF NOT GF OR QF THEN RETURN
3590 POKE 214,YP(Y):PRINT
3600 PRINT TAB(XP(X));DMS(X,Y):RETURN
4000 POKE 214,YP(Y):PRINT WH$

```



```

4010 PRINT TAB(XP(X));MID$(QTS,(Y-1)*XL+X,1);BKS
4020 RETURN
4500 FOR L=1 TO 3
4510 PRINT MID$(TS,(L-1)*39+1,39):NEXT L:RETURN
5000 CX=1:Z$(1)="" :Z$(2)=""
5010 POKE 214,20:PRINT:PRINT HS;SPS;SPS
5020 POKE 214,20:PRINT
5030 PRINT TAB(LEN(HS)+CX);RVS;SPS
5040 POKE 214,20:PRINT
5050 PRINT TAB(LEN(HS)+CX);SPS
5060 GET K$:IF K$="" THEN 5020
5070 IF K$=CHR$(20) THEN 5130
5080 IF K$=CHR$(13) THEN 5160
5090 IF K$<"0" OR K$>"9" THEN DL=50:GOSUB 3000:GOTO 50
20
5100 IF CX=3 THEN DL=50:GOSUB 3000:GOTO 5020
5110 POKE 214,20:PRINT:PRINT TAB(LEN(HS)+CX);K$
5120 Z$(CX)=K$:CX=CX+1:GOTO 5020
5130 IF CX=1 THEN DL=100:GOSUB 3000:GOTO 5020
5140 IF CX=2 THEN 5000
5150 Z$(2)="" :CX=2:GOTO 5020
5160 V=VAL(Z$(1)+Z$(2))
5170 POKE 214,20:PRINT:PRINT CL$
5180 IF V<1 OR V>MAX*2 THEN DL=100:GOSUB 3000:GOTO 500
0
5190 Y=INT((V-1)/XL)+1:X=V-(Y-1)*XL
5200 IF (TX=X AND TY=Y) OR DC(X,Y) THEN DL=100:GOSUB 3
000:GOTO 5000
5210 DF=0:GOSUB 3500:RETURN
5500 PRINT "PRESS ANY KEY TO CONTINUE.";
5510 GOSUB 2500:RETURN
6000 DATA 4,8,6,3,1,1,0,2,6,6,5,1,2,0,2,6,4,5,3,2,1
6010 DATA 4,4,4,7,3,3,1,2,3,2,11,7,5,3

```

After you have typed in the above lines, add the DATA statements (lines 9000-9480) from the Apple version.

IBM PC & compatibles/Memory Madness

```

10 SCREEN 0:DEF SEG=8H40:V=PEEK(8H10) AND 48:DEF SEG
20 IF V=32 THEN BKS=CHR$(219) ELSE BKS=CHR$(176)
30 DIM DMS(12,4),PAS(48),PQS(3),Z$(2)
40 DIM DC(12,4),MC(2),NL(2),XP(12),YP(4):WIDTH 80
50 COLOR 2,0:KEY OFF:LOCATE ,0:RANDOMIZE TIMER
60 CL$=STRING$(79,32):SPS=CHR$(32):PQS(0)="your"
70 PQS(1)="player #1's":PQS(2)="player #2's"
80 GOSUB 2000:PRINT "Would you like to ...:PRINT
90 PRINT "<1> Play a simple matching game, or"
100 PRINT "<2> Play a matching game about the United S
tates Constitution?"
110 GOSUB 2500
120 IF K$<"1" OR K$>"2" THEN SOUND 400,2:GOTO 110
130 GF=(K$="1"):GOSUB 2000
140 PRINT "How many players are there?"
150 GOSUB 2500
160 IF K$<"1" OR K$>"2" THEN SOUND 400,2:GOTO 150
170 PC=VAL(K$):FOR C=1 TO PC
180 GOSUB 2000
190 PRINT "What are ";PQS(C+(PC=1));" initials";
200 INPUT NAS(C):T=LEN(NAS(C))
210 IF T<2 OR T>3 THEN SOUND 400,2:GOTO 180
220 IF C=2 THEN IF NAS(1)=NAS(2) THEN SOUND 400,2:GOTO
180
230 NL(C)=INT(T/2):MC(C)=0:NEXT C:GOSUB 2000
240 PRINT "How large a game board would you like?"
250 PRINT:PRINT "<1> Jumbo (12 x 4)"
260 PRINT "<2> Extra Large (9 x 4)"
270 PRINT "<3> Large (6 x 4)"
280 PRINT "<4> Medium (4 x 4)"
290 PRINT "<5> Small (3 x 2)"
300 GOSUB 2500:T=VAL(K$)
310 IF T<1 OR T>5 THEN SOUND 400,2:GOTO 300
320 GOSUB 2000:TM=3:FOR C=1 TO 5
330 IF C=T THEN READ XL,YL,WW,WH,DX,DY:GOTO 350

```

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FUN-LEARNING PROGRAM

```

340 FOR L=1 TO 6:READ Z:NEXT L
350 NEXT C:MAX=XL*YL/2:FOR X=1 TO XL:FOR Y=1 TO YL
360 DC(X,Y)=0:DMS(X,Y)="" :NEXT Y,X:IF GF THEN 430
370 READ QS:TM=4:IF T<5 THEN WH=1:DY=0 ELSE WH=3:DY=1
380 T=LEN(QS):IF T>MAX*2 THEN QF=0:GOTO 430
390 PRINT "Do you want a hidden quotation in this game?"
400 GOSUB 2500:GOSUB 2000
410 IF K$<>"Y" AND K$<>CHR$(121) THEN QF=0:GOTO 430
420 QF=-1:QTS=QS+STRING$(MAX*2-T,32)
430 FOR C=65 TO 65+MAX-1:FOR W=1 TO 2
440 TX=INT(RND*XL)+1:TY=INT(RND*YL)+1
450 IF DMS(TX,TY)<>" " THEN 440
460 IF GF THEN 490
470 READ TS:IF LEN(TS)>79 THEN TS=LEFT$(TS,79)
480 PAS((TY-1)*XL+TX)=TS
490 DMS(TX,TY)=CHR$(C):NEXT W,C
500 FOR X=1 TO XL:XP(X)=(WW+1)*(X-1)+DX+5:NEXT X
510 FOR Y=1 TO YL:YP(Y)=TM+(WH+1)*(Y-1)+DY:NEXT Y
520 P=1:FRS=STRING$(WW*XL+XL+1,BK$)
530 LOCATE TM-1,1:FOR Y=1 TO WH*YL+YL+1
540 PRINT TAB(4);FRS:NEXT Y
550 FOR Y=1 TO YL:FOR X=1 TO XL
560 DF=(DC(X,Y)=0):GOSUB 3000
570 IF DC(X,Y) AND QF THEN GOSUB 3500
580 NEXT X,Y:IF PC=1 THEN 640
590 FOR C=1 TO 2:LOCATE 19,57+8*C-LEN(NAS(C))
600 PRINT NAS(C):NEXT C:PRINT TAB(53);"Score:"
610 COLOR 15:LOCATE 25,35:PRINT NAS(P);"'s turn";
620 COLOR 2:FOR C=1 TO 2:T=57+8*C-LEN(STR$(MC(C)))
630 LOCATE 20,T:PRINT MC(C):NEXT C
640 HS="Choose a square. --> ":TX=0:TY=0:GOSUB 4000
650 AS=DMS(X,Y):IF GF THEN 670
660 LOCATE 13,1:GOSUB 4500
670 TX=X:TY=Y:HS="Which is the matching square? --> "
680 GOSUB 4000:BS=DMS(X,Y):IF GF THEN 700
690 LOCATE 15,1:GOSUB 4500:PRINT STRING$(78,45)
700 MF=(AS=BS):IF NOT MF THEN 740
710 COLOR 10:LOCATE 21,1:PRINT "You have a match!"
720 COLOR 2:MC(P)=MC(P)+1:DC(X,Y)=-1:DC(TX,TY)=-1
730 IF NOT QF THEN 760 ELSE 770
740 SOUND 400,8:COLOR 12:LOCATE 21,1
750 PRINT "This is not a match!":COLOR 2
760 GOSUB 5000:IF GF THEN 910 ELSE 900
770 GOSUB 3500:COLOR 14:LOCATE YP(TY),XP(TX)
780 PRINT MID$(QTS,(TY-1)*XL+TX,1):COLOR 2
790 LOCATE 22,1:IF MC(1)+MC(2)+1=MAX THEN GOSUB 5000:GOTO 900
800 PRINT "Press <G> to guess the quotation,"
810 PRINT "or any other key to continue."
820 GOSUB 2500:IF K$<>"G" AND K$<>CHR$(103) THEN 900
830 GOSUB 2000:INPUT "What is the quotation";TS
840 IF TS=QS THEN 870
850 SOUND 400,4:PRINT "Sorry, that's not right!"
860 PRINT:GOSUB 5000:GOSUB 2000:GOTO 530
870 PRINT:PRINT "Congratulations, ";NAS(P);"!"
880 PRINT "You have guessed the quotation correctly!"
890 PRINT:MC(P)=MC(P)+MAX-MC(1)-MC(2):GOTO 1070
900 LOCATE 13,1:FOR L=1 TO 5:PRINT CLS:NEXT L
910 IF PC=1 OR MF THEN 940
920 IF PC=2 THEN P=P MOD 2+1
930 LOCATE 25,35:PRINT STRING$(10,32);
940 LOCATE 21,1:FOR C=1 TO 3:PRINT CLS
950 NEXT C:IF MF THEN 970
960 DF=-1:GOSUB 3000:X=TX:Y=TY:GOSUB 3000:GOTO 1010
970 IF QF THEN 1000
980 COLOR 15:LOCATE YP(Y),XP(X)-NL(P):PRINT NAS(P)
990 LOCATE YP(TY),XP(TX)-NL(P):PRINT NAS(P):COLOR 2
1000 IF MC(1)+MC(2)=MAX THEN 1020
1010 IF PC=1 THEN 640 ELSE 610
1020 IF PC=2 THEN 1050
1030 LOCATE 19,1:PRINT "Congratulations, ";NAS(P);"!"

```

```

1040 PRINT "You have successfully matched all the squares.":PRINT:END
1050 LOCATE 25,35:PRINT STRING$(10,32);
1060 LOCATE 19,1:PRINT CLS:PRINT CLS:LOCATE 19,1
1070 IF MC(1)=MC(2) THEN PRINT "This game is a draw.":PRINT:END
1080 IF MC(1)>MC(2) THEN T=1 ELSE T=2
1090 PRINT NAS(T);" wins with a score of";
1100 PRINT MC(T);"out of";MAX;"matches.":PRINT:END
2000 CLS:PRINT TAB(34);"MEMORY MADNESS":PRINT:RETURN
2500 K$=INKEY$:IF K$="" THEN 2500 ELSE RETURN
3000 IF DF THEN COLOR 1,1:T=219 ELSE T=32
3010 TS=STRING$(WW,T):FOR YC=YP(Y) TO YP(Y)+WH-1
3020 LOCATE YC-DY,XP(X)-DX:PRINT TS:NEXT YC
3030 IF NOT DF THEN 3070
3040 COLOR 14:LOCATE YP(Y),XP(X)
3050 PRINT MID$(STR$(XL*(Y-1)+X),2)
3060 COLOR 2,0:RETURN
3070 IF NOT GF OR QF THEN RETURN
3080 COLOR 14:LOCATE YP(Y),XP(X)
3090 PRINT DMS(X,Y):COLOR 2:RETURN
3500 COLOR 14:LOCATE YP(Y),XP(X)
3510 PRINT MID$(QTS,(Y-1)*XL+X,1):COLOR 2:RETURN
4000 CX=1:Z$(1)="" :Z$(2)=""
4010 LOCATE 21,1:PRINT HS;SP$;SP$
4020 LOCATE 21,LEN(HS)+CX:PRINT CHR$(219)
4030 LOCATE 21,LEN(HS)+CX:PRINT SP$
4040 K$=INKEY$:IF K$="" THEN 4020
4050 IF K$=CHR$(8) THEN 4110
4060 IF K$=CHR$(13) THEN 4140
4070 IF K$<"0" OR K$>"9" THEN SOUND 400,2:GOTO 4020
4080 IF CX=3 THEN SOUND 400,2:GOTO 4020
4090 LOCATE 21,LEN(HS)+CX:PRINT K$
4100 Z$(CX)=K$:CX=CX+1:GOTO 4020
4110 IF CX=1 THEN SOUND 400,4:GOTO 4020
4120 IF CX=2 THEN 4000
4130 Z$(2)="" :CX=2:GOTO 4020
4140 V=VAL(Z$(1)+Z$(2))
4150 LOCATE 21,1:PRINT CLS
4160 IF V<1 OR V>MAX*2 THEN SOUND 400,2:GOTO 4000
4170 Y=INT((V-1)/XL)+1:X=V-(Y-1)*XL
4180 IF (TX=X AND TY=Y) OR DC(X,Y) THEN SOUND 400,4:GOTO 4000
4190 DF=0:GOSUB 3000:RETURN
4500 PRINT STRING$(37+(V>9),45);V;STRING$(37,45)
4510 PRINT PAS(V):RETURN
5000 PRINT "Press any key to continue."
5010 GOSUB 2500:RETURN
5500 DATA 12,4,5,3,2,1,9,4,7,3,3,1,6,4,11,3,5,1
5510 DATA 4,4,17,3,9,1,3,2,23,7,11,3

```

After you have typed in the above lines, add the DATA statements (lines 9000-9480) from the Apple version.

CROSSWORD PUZZLER

BY STEVE C.M. CHEN AND KAREN KANE

This is the third in a series of crossword puzzles. This month, clues and data for a back-to-school puzzle are presented along with the solution to last month's puzzle. The solution to the back-to-school Crossword Puzzler will appear in next month's issue along with data for a new puzzle.

In order to solve or print out the puzzle, you must have the master puzzle program. The Commodore

64/128, IBM PC and compatibles, and Tandy Color Computer versions of the program were presented in the July issue, and the Adam, Apple, Atari, and Macintosh versions appeared in August. Back issues of the July and August issues are available for \$3.95 from Crossword Puzzler, c/o FAMILY COMPUTING, 730 Broadway, New York, NY 10003. Please indicate your specific brand and model of computer.

BACK-TO-SCHOOL PUZZLE DATA

A FAKA, FBKB, ICKC, ADND, 1113
B ODAE, BECE, HEEF, GFNF, 1121
C GGJG, KGMG, DHLH, CIEI, 1151
D FIII, BJII, KJHK, MKNK, 1177
E OKAL, BLLO, EMGM, ENJN, 1185
F EOJO, ZZZZ, ZZZZ, ZZZZ, 6381

BACK-TO-SCHOOL PUZZLE CLUES

Across

- 1A Tries
1G What a thief cracks; secure
1L School subject
2A An established rule or principle
2G Ailments
2L Egg-shaped
3A Tells a story
3L Tears
4B Carousel
5D To be, to Henri
5I Wilbur's brother in flight
6A Designer Picone
6H Study of plant life
7A Past participle of get
7H Beatles member with JL, GH, and PM
7N Manganese, abbr.
8A A phone company
8E Aztec spear throwers
8M Spelling contest
9A Compass direction
9G Three-toed sloth
9J Neck scarves
10C Season when school starts
10L At the end
11A Sodium fluoride union
11I Not dose or dem
12C Basics
13A One who fibs
13H Character in Shakespeare's *Julius Caesar*
14A What God took from Adam (two words)
14F One in *Born Free*
14K At no time
15A Instruments for rowing

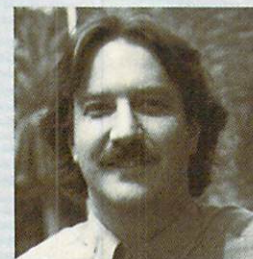
- 15F Impudent speech
15K Actress Garbo

Down

- 1A Treat leather
1B Test
1C Father
1D Rush
1E Intelligent
1G Throne (obs.)
1H Too
1I Florida, abbr.
1J Accompany
1L Time of day
1M Eagerly
1N Spigot
1O Laid in this place, Latin abbr.
3F Oppressive ruler
4I Perch
4K Mr. Jefferson designed this school
5O Actor Borgnine
6A Coaxes (two words)
6B Express an opinion
6C Homonym for eight
6H Organ for thinking
7E Publisher of *Music Construction Set*, abbr.
7N NY baseball team
8G Greek letter with the beta
8J Dormant
8K Nazi secret police
8M Type of snake
9D Residential areas on the outskirts of a city
9L Wally and Beaver's last name
10C Public matter or concern
10E 2,000 pounds
10F Reverses
11I Tens, comb. form
11K Pang
12H Bog
12M To be alive
12N Tallow
13A Thai language
13B Thorn in M. Thatcher's side
13O Mrs., in Madrid
14G French article

RAZ-MA-JAZZ

BY JOEY LATIMER



Type Raz-Ma-Jazz into your computer, SAVE it, RUN it, then grab your dancing shoes. Your computer will start playing a finger-snapping boogie-woogie song—complete with horn parts and roll-

ing bass—through the speaker in your TV or video monitor. Get your neighbors to get their neighbors to Raz-Ma-Jazz and the whole city will hop! PROGRAMMING NOTES: If you want to speed up or slow down Raz-Ma-Jazz, change the value assigned to SP in the first program line. To play the song faster, set SP equal to a lower number, and to slow it down, assign a higher value to SP. SP must be between 1 and 10.

Atari 800XL/XE/Raz-Ma-Jazz

```
10 SP=5: DIM V1(96,2), V2(36,2), V3(76,2)
20 POKE 710,144: POKE 752,1
30 FOR X=1 TO 48: READ A,B: V1(X,1)=A: V1(X,2)=B
40 V1(48+X,1)=V1(X,1): V1(48+X,2)=V1(X,2): NEXT X
50 FOR X=1 TO 36: READ A,B: V2(X,1)=A: V2(X,2)=B: NEXT X
60 FOR X=1 TO 76: READ A,B: V3(X,1)=A: V3(X,2)=B: NEXT X
70 PRINT CHR$(125): POSITION 13,9
80 PRINT "* RAZ-MA-JAZZ *"
90 P1=1: P2=1: P3=1: T1=0: T2=0: T3=0
100 SOUND 1, V1(P1,1), 10,8
110 SOUND 2, V2(P2,1), 10,6: SOUND 3, V3(P3,1), 10,8
120 FOR DE=1 TO SP*5: NEXT DE
130 T1=T1+1
140 IF T1=V1(P1,2) THEN T1=0: P1=P1+1: SOUND 1,0,0,0
150 T2=T2+1
160 IF T2=V2(P2,2) THEN T2=0: P2=P2+1: SOUND 2,0,0,0
170 T3=T3+1
180 IF T3=V3(P3,2) THEN T3=0: P3=P3+1: SOUND 3,0,0,0
190 IF P1=97 THEN 90
200 GOTO 100
1000 DATA 243,2,193,2,162,2,144,2,136,2,144,1,162,3
1010 DATA 193,2,243,2,193,2,162,2,144,2,136,2,144,1
1020 DATA 162,3,193,2,182,2,144,2,121,2,108,2,102,2
1030 DATA 108,1,121,3,144,2,243,2,193,2,162,2,144,2
1040 DATA 136,2,144,1,162,3,193,2,162,2,128,2,108,2
1050 DATA 96,2,91,2,96,1,108,3,128,2,243,2,193,2
1060 DATA 162,2,144,2,136,2,144,1,162,3,193,2
2000 DATA 136,6,0,2,136,2,144,1,136,3,0,2,136,6,0,2
2020 DATA 136,2,144,1,136,3,0,2,102,6,0,2,102,2,108
2030 DATA 1,102,3,0,2,136,6,0,2,136,2,144,1,136,3,0,2
2040 DATA 91,6,0,2,91,2,96,1,91,3,0,2,136,6,0,2,136,2
2050 DATA 144,1,136,3,0,98
3000 DATA 108,6,0,2,108,2,114,1,108,3,0,2,108,6,0,2
3010 DATA 108,2,114,1,108,3,0,2,81,6,0,2,81,2,85,1
3030 DATA 81,3,0,2,108,6,0,2,108,2,114,1,108,3,0,2
3040 DATA 72,6,0,2,72,2,76,1,72,3,0,2,108,6,0,2,108
3050 DATA 2,114,1,108,3,0,2
4000 DATA 60,2,60,2,81,1,91,1,102,1,91,1,81,2,81,2
4010 DATA 91,1,102,1,121,2,121,4,102,4,91,4,81,4
4020 DATA 60,2,60,2,81,1,91,1,102,1,91,1,81,2,81,2
4030 DATA 91,1,102,1,121,2,81,4,91,4,121,8,81,2
4040 DATA 81,2,81,4,81,1,72,1,81,1,96,1,81,2,81,2
4050 DATA 121,14,0,4
```


Commodore 64 & 128 (C 64 mode)/Raz-Ma-Jazz

IBM PCjr & compatibles/Raz-Ma-Jazz

Macintosh/Raz-Ma-Jazz

TI-99/4A/Raz-Ma-Jazz

90 FAMILY COMPUTING


```

100 FOR X=1 TO 76
110 READ V3(X,1),V3(X,2)
120 NEXT X
130 CALL CLEAR
140 PRINT "-----* RAZ-MA-JAZZ *-----"
150 FOR X=1 TO 11
160 PRINT
170 NEXT X
180 P1=1
190 P2=1
200 P3=1
210 T1=0
220 T2=0
230 T3=0
240 CALL SOUND(-120,V1(P1,1),2,V2(P2,1),4,V3(P3,1),4)
250 T1=T1+1
260 IF T1<>V1(P1,2) THEN 290
270 T1=0
280 P1=P1+1
290 T2=T2+1
300 IF T2<>V2(P2,2) THEN 330
310 T2=0
320 P2=P2+1
330 T3=T3+1
340 IF T3<>V3(P3,2) THEN 370
350 T3=0
360 P3=P3+1
370 IF P1=97 THEN 180 ELSE 240
1000 DATA 131,2,165,2,196,2,220,2,233,2,220,1,196,3
1010 DATA 165,2,131,2,165,2,196,2,220,2,233,2,220,1
1020 DATA 196,3,165,2,175,2,220,2,262,2,294,2,311,2
1030 DATA 294,1,262,3,220,2,131,2,165,2,196,2,220,2
1040 DATA 233,2,220,1,196,3,165,2,196,2,247,2,294,2
1050 DATA 330,2,349,2,330,1,294,3,247,2,131,2,165,2
1060 DATA 196,2,220,2,233,2,220,1,196,3,165,2
2000 DATA 233,6,40000,2,233,2,220,1,233,3,40000,2,233
2010 DATA 6,40000,2,233,2,220,1,233,3,40000,2,311,6
2020 DATA 40000,2,311,2,294,1,311,3,40000,2,233,6
2030 DATA 40000,2,233,2,220,1,233,3,40000,2,349,6
2040 DATA 40000,2,349,2,330,1,349,3,40000,2,233,6
2050 DATA 40000,2,233,2,220,1,233,3,40000,98
3000 DATA 294,6,40000,2,294,2,277,1,294,3,40000,2,294
3010 DATA 6,40000,2,294,2,277,1,294,3,40000,2,392,6
3020 DATA 40000,2,392,2,370,1,392,3,40000,2,294,6
3030 DATA 40000,2,294,2,277,1,294,3,40000,2,440,6
3040 DATA 40000,2,440,2,415,1,440,3,40000,2,294,6
3050 DATA 40000,2,294,2,277,1,294,3,40000,2,523,2
3060 DATA 523,2,392,1,349,1,311,1,349,1,392,2,392,2
3070 DATA 349,1,311,1,262,2,262,4,311,4,349,4,392,4
3080 DATA 523,2,523,2,392,1,349,1,311,1,349,1,392,2
3090 DATA 392,2,349,1,311,1,262,2,392,4,349,4,262,8
3100 DATA 292,2,392,2,392,4,392,1,440,1,392,1,330,1
3110 DATA 392,2,392,2,262,14,40000,4

```

TIPS TO THE TYPIST

SOME GENERAL RULES

1. Read instructions and program headings carefully.
2. Don't let fatigue and boredom contribute to inaccuracy. If you're new to programming, type in a longer program in easy stages, saving each installment as you go.
3. Assume that every character in a program listing must be copied accurately if a program is to work.
4. Watch out for potential trouble spots. About 90 per-

cent of all typing errors occur in DATA statements.

5. Be aware that our program listings are printed 54 characters wide. Thus, a single BASIC program "line" (sometimes called a "logical line") may appear as several lines in our listing. If you are typing along and reach the right margin of the printed listing, don't press RETURN or ENTER before checking to see if the program "line" you're typing really ends there.

6. To correct an error in a BASIC program line, type the line in again from the beginning, and press RETURN or ENTER to replace the old line.

WHICH PROGRAM WILL RUN ON MY COMPUTER?

- Apple programs run under Applesoft (not Integer) BASIC on the Apple II (with language card), II Plus, IIe, and IIfx.
- IBM compatibility of BASIC programs is determined by both the hardware and the version of BASIC used. Our programs for IBM PC and compatibles are composed on IBM PCs and PCjr's, and are tested under most versions of BASIC available for these machines. Each "IBM PC and compatibles" program listing is supplemented by a run-down of the machines and versions of BASIC under which the program is guaranteed to work.
- TI programs not marked "w/TI Extended BASIC" should be run under standard (console) TI BASIC.

DEBUGGING HINTS

1. Write down any error messages you receive.
2. Look up error messages in your manual, and check the indicated lines for simple mistakes. Also check related lines, such as the DATA statements corresponding to a READ routine. Correct all the problems you can find, and save a corrected copy of the program before typing RUN again.
3. LIST the program in screen-size chunks (check your manual for instructions on how to LIST parts of a program) or get a printout. Compare what you've typed in—letter by letter—to the published program. Make sure that you haven't dropped or mixed up some punctuation, switched uppercase text for lowercase, or vice versa, or miscounted the characters (and/or spaces) between a pair of quotes.
4. Mistakes in DATA statements are the single most common cause of program failures. If you can't find your error in the lines the computer specifies, check your DATA statements line by line, letter by letter, comma by comma.
5. If all else fails, turn off your computer and relax. Then try again the next day—exhausted proofreaders are careless proofreaders.

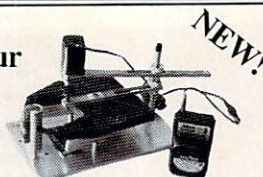
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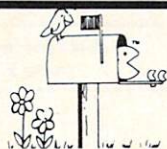
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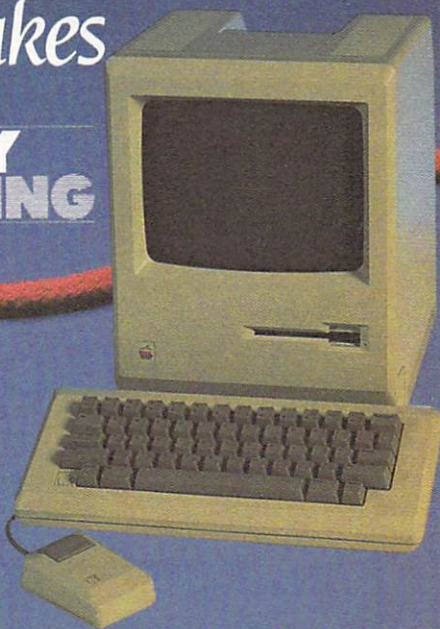
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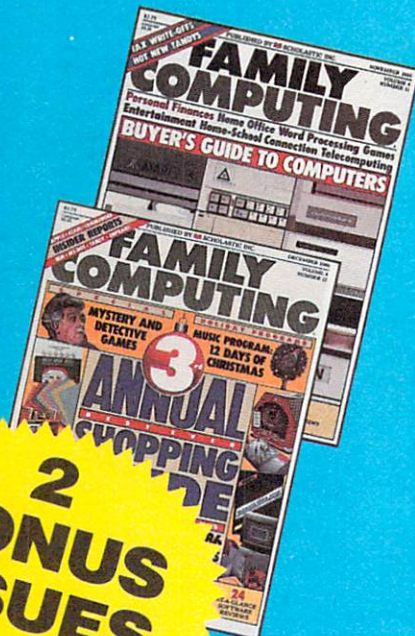
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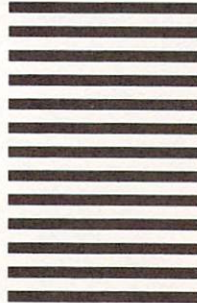
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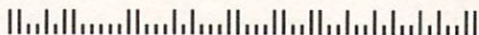
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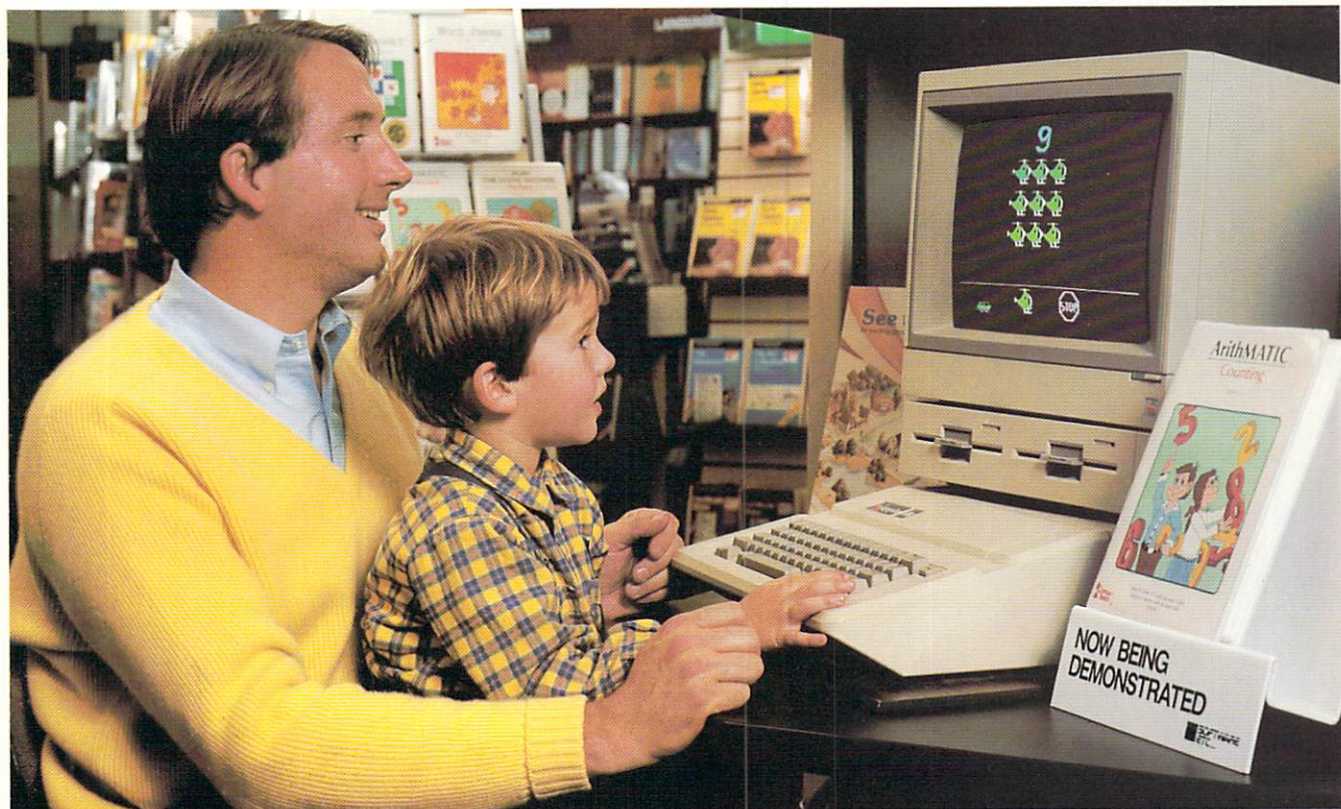
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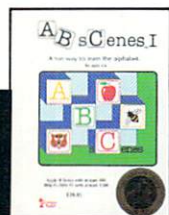
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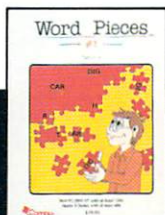
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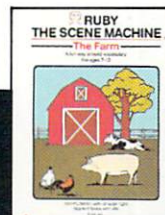
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